HOW PRINCIPALS OPERATIONALIZE THEIR BELIEFS

IN THE SCHOOL SETTING

by

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Decades of research on implicit theories of intelligence have led to the development of the construct of the growth or fixed mindset (Dweck, 2006). Additionally, the characteristics of an effective educator are identified as believing in a growth mindset of ability, emphasizing the process of learning, setting high standards, creating a nurturing atmosphere and endorsing hard work, effort, persistence and resiliency (Dweck, 2006). These practices are related to the descriptors of a Socializing Intelligence environment in the Principles of Learning (Resnick, 2001). Principals establish the culture of their building through the implementation of their key roles as principals including establishing a vision of academic success for all students, creating an environment hospitable to learning and improving instruction (Wallace Foundation, 2013). This exploratory study is designed to ascertain the self-reported mindset of building level administrators and to assess the types of practices the principal endorses in her building. A regional sample of principals (n=142) from western Pennsylvania participated in the survey. The *Theories of Intelligence Scale – Others Form* (Dweck, 1999) and portions of the *Patterns of Adaptive Learning Strategies Scale* (Midgley, et al., 2000) were used to survey participants. Findings indicate that 77% of the building level leaders self-reported a growth mindset of ability while 4% self-reported a fixed mindset. The remaining 17% fell somewhere in between the two.

These results are not reflective of the typical results when using the Dweck scale. PALS scale scores were normal and comparable to previous scores. Further correlation calculations showed no significant relationship between the principals' practices and self-reported theories of intelligence. The principals in the survey sample endorsed the mastery-goal structure and mastery-approaches to instruction practices at a higher rate than the performance items indicating their promotion of practices that align with the Principles of Learning.

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PREFACE

It is hard to believe this journey has finally come to an end. I am so overjoyed! First, I must acknowledge my wonderful, patient, and loving husband who has carried the weight of our lives on his shoulders as I missed endless soccer games, trips to the mall, etc. I love you Scott forever and always! To my children, Leesha and Cameron, I pray that you understand that education is so important and one of many things in this life that will help you achieve your hopes and dreams. I also would like to acknowledge Dr. Charlene Trovato, my Dissertation Advisor, who has been the force behind my success, pushing me, supporting me, encouraging me at every step. Thank you for influencing and inspiring my professional life with your wisdom and experience. To my committee, Dr. William Bickel, Dr. Mary Margaret Kerr and Dr. Diane Kirk, thank you for being my architect, my interior designer and my electrician as I crafted my work. Your support, insight, questions, and kind words helped pull me along at each milestone. To my statistician, Jason Colditz, who is my superman in this journey. Thank you for teaching me the dreaded stats! You are amazing! Thank you for all your understanding and patience. I am so thankful for my friends and family who prayed and mentored me through the craziness. Your love, endless prayers, and support will not be forgotten. Lastly, I dedicate this work to my mother, Mary Elizabeth Ralston, who left this earth on August 31, 1982 and Aletha Rebecca Smail, the second mom God gave me. These woman have stretched me and taught me education

is power. Education enables you to be an overcomer and never be a victim of your circumstances.

1.0 INTRODUCTION

Schooling in the United States has been a cornerstone of our culture, essential for all children regardless of origin, race, gender, or intelligence since the 17th century. When it comes to classroom structure and subjects taught, each of us shares a similar school experience. In the 1700s, schooling was perceived as necessary to ensure literacy for religious sustainability. In later years, educational reformers like Horace Mann believed that common schooling was needed to grow a nation with values and common knowledge (Rury, 2009). As the country began to grow through industrialization and urbanization, schooling continued to evolve with the rush of society. Public schools were developed with a factory-inspired mentality focused on mass education they taught authority, repetitiveness, and the tolerance of boredom, which were qualities necessary to be a good factory worker (Rury, 2009). Moreover, schools became vehicles to prepare citizens for their social roles and places in society. At the turn of the century, testing began to play a significant part in the classification of students.

Fast-forwarding to the 21st century, little about the American education system has changed. We continue to test student intelligence and use the collected data to predict curricular opportunities. The design of our schools continues to be factory-inspired, with an expectation that some students will not possess the intelligence to succeed. Likewise, deep within our society, we have somehow placed ability on a pedestal, making it the crucial element of

academic success. Along with it have emerged the entrenched beliefs we hold regarding performance and effort.

In my experiences as a teacher and as a school leader, I have worked with and supervised educators who have had varying beliefs about student ability, performance, and effort. Some educators believe that students who have not done well on past assessments will continue to have the same type of performance on future assessments. Additionally, some educators tend to teach from a skills-based approach that emphasizes memorization rather than letting students wrestle with concepts and generate new knowledge and connections. The underlying reasons for why educators are comfortable making such determinations are rooted within their beliefs as people rather than the actual talents and abilities of the students.

While at the University of Pittsburgh, my faculty advisor introduced me to Carol Dweck's work involving mindsets. I find Dr. Dweck's work to be fascinating and it has become the basis for my study. Dr. Dweck has spent decades investigating why people are helpless or resilient in the face of failure. Her resulting research has identified two mindsets: the fixed mindset and the growth mindset (Dweck, 2006). She believes that people possess one or the other and react to circumstances based on their mindset. The implications of her work in the education setting are not fully realized, as the concepts are just beginning to become a topic of discussion among educators. My research study provides baseline information to begin the mindset discussion as it relates to educators and the decisions they make each day in the school setting.

1.1 GLOSSARY OF KEY TERMS

Implicit Theories of Intelligence: Two theories of intelligence exist. An incremental theorist believes intelligence is malleable and can be developed. An entity theorist believes intelligence is fixed and unchangeable (Dweck & Leggett, 1988, p. 262).

Growth Mindset: A "mindset based on the belief that your basic qualities are characteristics you can cultivate through your efforts" (Dweck, 2006, p. 7).

Fixed Mindset: A "mindset based on the belief that your basic qualities are carved in stone, which creates an urgency to prove yourself over and over" (Dweck, 2006, p.6).

Socializing Intelligence: Treats intelligence as a social construct. "People who are intelligent-in-practice believe they have the right and the obligation to understand things and make things work; believe that problems can be analyzed, that solutions often come from such analysis, and that they are capable of that analysis; have a toolkit of problem-analysis tools and good intuitions about when to use them; know how to ask questions, seek help, and get enough information to solve problems and have habits of mind that lead them to actively use the toolkit of analysis skills and the various strategies for acquiring information" (Resnick & Nelson-Le-Gall, 1997, p. 6-7).

2.0 REVIEW OF LITERATURE

To gain an appreciation and understanding of the how intelligence, performance, and effort relate in the school setting and impact educator and student beliefs, it is essential to review current and past research. This review of literature will help the reader grasp the concepts of theories of intelligence; understand how society contributes to these concepts; and recognize how the concepts can affect educator decisions in the school setting.

2.1 INTELLIGENCE

Throughout history, intelligence has been thought of as a genetically determined mental ability or quality that dictates the capacity a person has for learning (Resnick, 1997). Others have attempted to expand the definition; however, they continued to "treat intelligence as an attribute of the individual" (Resnick, 1997, p. 3). This alludes to some innate, fixed aptitude a person possesses. Much of what we believe about intelligence is rooted in our academic achievement and experiences in schools, which are reflective of society's beliefs.

2.1.1 Implicit Theories of Intelligence

Decades of research on implicit theories of intelligence have laid the foundation for understanding how learners frame their responses to challenges in the classroom (Blackwell, Trzesniewski, & Dweck, 2007; Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin & Wan, 1999; Mangels, Butterfield, Lamb, Good & Dweck, 2006). Human beings possess two implicit theories of intelligence. One view says intelligence is a fixed, static characteristic or trait with which each person is born. People who believe that intelligence is unchangeable are "entity theorists." They live in a world where everything is a challenge to their ability. They equate aptitude with success and a lack of ability results in failure. The other implicit theory of intelligence is "incremental theory." People who embrace this theory of intelligence believe intelligence is malleable and can grow over time (Dweck & Leggett, 1988, p. 262). Unlike their entity theorists peers, incremental theorists live in a world full of learning and growth. They seek challenging tasks as a way to grow their ability and failure is equivalent to a lack of effort not ability.

The entity theory of intelligence has permeated education for many years, resulting in the rationale for many of the procedures utilized to determine who is smart and who is not. For example, in middle school, students often participate in exams utilized to sort or rank them for scheduling of math and language arts courses. The aptitude demonstrated on the exam becomes the predictor for success in more challenging curriculum. IQ tests are used to determine which students are worthy of enriched programs prepared for the gifted and talented. Achievement tests compare students to each other instead of measuring a student's individual performance against a benchmark of excellence. These institutionalized approaches to aptitude have sustained the idea that intelligence is innate and fixed by reinforcing that some students are not capable of

higher levels of learning (Resnick, 1995). As a result, parents and students alike embrace an entity theory of intelligence thus accepting the belief that ability is fixed and unchangeable. According to Resnick (1995), "students do not try to break the barrier of low expectations because, they, like teachers and parents accept the judgment that aptitude matters most and they do not have the right kinds of aptitude" (p. 57).

Furthermore, when children believe that their intelligence is innate and out of their control, Danielson (2002) writes, "they can become paralyzed and fatalistic" by the idea that they can do nothing to improve their performance. These learners become "performance goal-oriented," meaning that every task they complete must reinforce their ability. The student attributes failure to a lack of ability. When entity theorists were offered remedial help in a study conducted by Hong, et al., in 1999, they tended to view the assistance as unnecessary because their ability is fixed and unchangeable; therefore, remediation will do nothing to change their situation. Thus, research on entity theorist response demonstrates that students withdraw from a challenge to protect their perceived ability. Moreover, when compared to their incremental theorists peers, entity theorists are less likely to remediate their errors and gain knowledge after failure (Mangels, Butterfield, Lamb, Good & Dweck, 2006). This response, defined as a helpless pattern, characterizes an avoidance of difficult tasks and decreased performance as tasks become more challenging (Blackwell, et al. 2007; Dweck & Leggett, 1988; Hong et al., 1999; Mangels et al., 2006). The behavior is a maladaptive response pattern and is evident in much of the research involving implicit theories of intelligence. The research showed that students who possess an entity theorist's view of intelligence avoid problems that are more challenging and become helpless in the face of failure, leading to a downward trajectory of performance over time (Blackwell et al., 2007).

On the contrary, the incremental theorists are learning goal-driven. They focus on mastering content and striving to improve their ability through effort (Dweck, 2006). Instead of possessing a helpless pattern in the face of adversity, these students have a mastery-oriented pattern, which is characterized by the seeking of challenging tasks and pressing on toward a goal, regardless of effort needed. Schools need educational reform that associates ability and effort in a positive manner so that genuine effort creates ability (Resnick, 1995). If a student believes his intelligence is malleable, it would make sense that through effort, she could create ability (Resnick, 1995).

Seventh-grade math students who were introduced to the incremental theory of intelligence were predicted to outperform their entity-theorist peers over time. The first in a series of studies conducted to test this theory identified each student's theory of intelligence, then followed his or her achievement over a two-year period. Students with an incremental theory of intelligence were more likely to set learning goals and were more mastery-oriented in the face of failure (Blackwell et al., 2007). Learners who possessed an entity theorist's approach to intelligence were unmotivated to remediate their failure and, consequently, their achievement continued to decline over time. The second study focused on two groups of low-performing students over the same two years. These students were split into a control group who received brain theory classes while the variable group participated in brain theory and incremental theory of intelligence instruction. Students in the variable group reversed their downward achievement trajectory. Initially, students with an entity theorist's view of intelligence gained the most in achievement levels over the two-year study; however, the incremental theorists made the most gains overall. Thus, a student's implicit theory of intelligence affects his or her level of performance (Blackwell et al., 2007). Additionally, the study further concludes that changing a

student's view of intelligence will improve his or her achievement by reinforcing incremental theory, stronger learning goals, and positive beliefs about effort (Blackwell et al., 2007). The figure below illustrates the two implicit theories of intelligence, the type of goal setting, and the response in the face of failure.

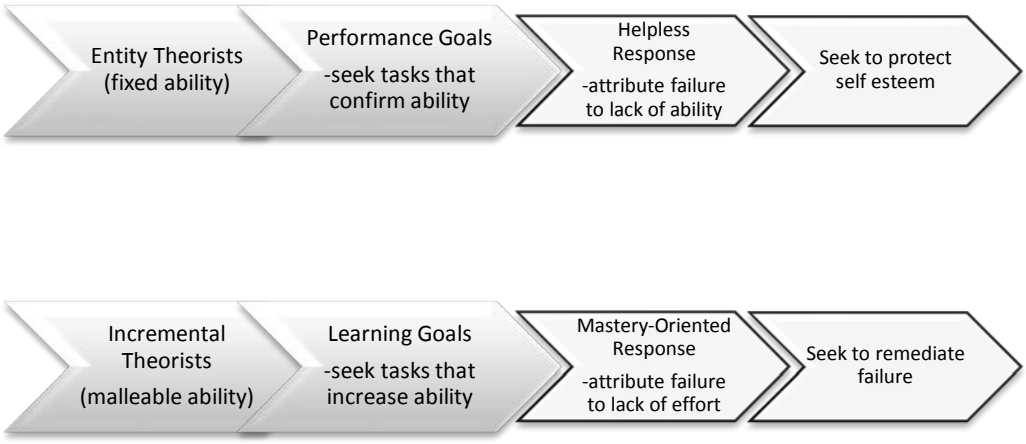

Figure 1: Entity Theorists vs. Incremental Theorists

(Blackwell et al., 2007; Dweck & Leggett, 1988; Dweck, 2006)

Learners interpret and react to the world around them based upon their helpless or mastery-oriented patterns. In academic achievement, implicit theories of intelligence provide the framework for student goal strategies, which are either performance-based or learning-based (Dweck & Leggett, 1988). Performance goals measure success by accumulating favorable judgments of students' ability while learning goals measure how much their ability has increased. Students with equal levels of ability exhibit both of these patterns. A relationship exists between a student's beliefs about ability and his classroom performance (Blackwell, 2007; Mangels et al., 2006). Blackwell (2007) states, "Children's beliefs become the mental baggage

that they bring to the achievement situation" (p. 259). Moreover, these self-perceptions, theories of intelligence, goal strategies, and beliefs about effort and performance --interwoven in our beliefs as students, parents, educators, and communities-- affect the daily achievement of learners in the classroom daily.

People will react to the world around them based on a person's implicit theory of intelligence. The question is, where do these ideas about intelligence originate? The next section will discuss the research in relationship to the perceptions of intelligence that have been manifested in our society.

2.1.2 Societal Perception of Intelligence

Societal perceptions of ability play a major role in influencing student, educator, and parental views of intelligence in the school setting. Society does not consider intelligence as the ability to think critically, to problem solve, or to add life experience to a situation. Fundamentally, intelligence is viewed as a fixed attribute much like Calvin does in a favorite *Calvin and Hobbes* comic strip. Calvin chastises another character, Susie, for doing extra work to understand a concept. Susie responds, "Well, now I understand it." Calvin concludes, "Huh, I used to think you were smart" (Watterson, 1995). Calvin's beliefs about intelligence and ultimate perceptions about people exemplify our culture today; even so, these ideas about intelligence were cultivated long before Watterson started creating his comic strips. Throughout history, ability has played a significant role in the sorting and sifting of American citizens.

During the 19th century, the United States was in a time of chaos and growth. The Industrial Revolution was in full swing and immigrants were pouring into the nation. The "society of the day was elitist, racist, and sexist; its actions fueled by a fear of diluting 'Anglo-

Saxon purity'" (Costa & Kallick, 2000, p. 2). The aristocrats scurried to separate themselves from the others through a measurement that would categorize and distinguish them, proving they were not like the commoners. Prominent thinkers of the day, such as 19th century physicist and astronomer Lord Kelvin, claimed, "If you cannot measure it, if you cannot express it in numbers, your knowledge is of a very meager and unsatisfactory kind" (Costa & Kallick, 2000, p. 2). Likewise, 19th-century psychologist Charles Spearman believed intelligence is measurable via a test score and is reflective of one's genetic makeup, thus, reinforcing the idea that intelligence is a measureable and static trait (Costa & Kallick, 2000). Furthermore, the United States Army began using intelligence tests to determine soldier eligibility for training opportunities and to identify those capable of serving as officers. The tests enabled Army officials to categorize their recruits by perceived potential, based on testing more quickly and efficiently (Rury, 2009), further reinforcing the idea, that intelligence is an inherent capacity or potential. The United States Army's use of intelligence testing and a belief that intelligence is fixed would construct the foundation needed to crosswalk this type of testing and belief system into the American school structure.

Schools would use intelligence testing and eventually other types of testing to categorize students into groups offering curriculum most suitable to their "ability" (Resnick, 1995). In the mid-1970s, a common practice by elementary schools was grouping students by their reading ability. Blue Jays were the top group or high ability group. They received enriched curriculum to which the low group did not have access. Low-group or low-ability students received a lesser curriculum aligned to their preconceived level of achievement, thus, creating a gap in access to educational opportunities (Resnick, 1995). Thus, the belief that "aptitude is the primary determinant in learning" became entrenched in our American education system (Resnick, 1995,

p. 56). Even Calvin recognized his friend's past performance and used it as a basis for his comments regarding her intelligence and present behavior.

Additionally, teachers practiced grading on a bell curve. Although originally meant to describe groups of random data establishing a statistical reference called a "normal distribution," the bell curve was utilized in education as a predictor of levels of performance for a group of students in a classroom so that there should be X number of As, Y number of Bs, Z number of Cs and so on. The bell-curve mentality in the classrooms expects that some students will not succeed, thus lowering expectations for lower-performing students (Danielson, 2002). Consequently, as educators filter their learners through the entity theorist's view of intelligence, as our current system requires, it becomes acceptable that some students will simply fail. Once teachers accept such a belief, they may unknowingly limit their ability to create a culture that believes all students are capable of learning.

Just as Calvin based his assessment of his friend's situation on her past performance, student performance on assessment has become the single most important indicator of success in American society. Federal mandates like No Child Left Behind (2002) have continued to reinforce the importance of performance. These mandates coupled with society's view of intelligence confirm the idea that students and school entities alike are only as good as their last performance on the test. Our "culture promotes particular type of beliefs that impact teaching and learning" (Ahmad, 2011, p. 37). Ability is the key to success in our educational system. School entities that do not score in the required performance range are rated as bad schools with bad teachers who are not doing their jobs. These perceptions regarding ability and performance are deeply rooted in our society's beliefs about intelligence; they have laid the foundation for

today's American education system. Likewise, they have contributed to our mindsets as described in the next section.

2.1.3 Mindsets

Throughout the review of literature, I have come to appreciate the work of Carol Dweck from the University of Stanford. She has spent decades of research focusing on how people respond to failure based on their implicit theories of personality and ability. Her work seeks answers to questions like, "What are the consequences of thinking that your intelligence or personality is something you can develop, as opposed to something that is a fixed, deep-seated trait?" (Dweck, 2006, p. 4) In the book *Mindset: The New Psychology of Success,* she describes what she calls "mindsets" people possess. These mindsets, the fixed mindset and the growth mindset, are cultivated in people by their implicit theories, their parents, their schooling, and others who influence their lives.

Like the entity theorist, the fixed mindset is one in which people believe qualities like personality and ability are static, innate and cannot be changed (Dweck, 2006). People with a fixed mindset measure themselves based on their last performance, which leads to a belief that they are only as good as their last performance at any time in their minds. Short-term outcomes are more important than long-term outcomes resulting in a lack of value in learning and putting in effort. Failure to a fixed-mindset person results because she feels she is not smart enough, lacks the talent, or does not have whatever it takes to be successful. When effort is required for success, it simply means a person does not possess the necessary talent or intelligence to complete the task (Dweck).

Often, the fixed mindset causes people to believe that success is about proving they are smart, not about mastering goals or learning. This is evident in the discussion of a study conducted at the University of Hong Kong, where students receive all materials, instruction, and assessment in English (Dweck, 2006). The study targeted students who were not fluent in English. After determining each student's mindset, the students were asked if they would want to participate in a course to strengthen their English fluency. As predicted, students with a fixed mindset were not interested in the course. Instead of admitting their deficiencies, these students would rather continue to feel smart in the short term while risking their future success at an English-speaking university (Dweck).

In contrast, the growth mindset causes people to believe "that your basic qualities are things you can cultivate through your efforts" (Dweck, 2006, p. 7). People with a growth mindset are more concerned with the process rather than the performance. Each situation is an opportunity to learn and grow. Failure means that more work is needed to master a task. It is an opportunity to learn more and stretch your intelligence. Long-term goals are more important than appearing successful in the short term. When more effort is required, it means success will be the reward of hard work and perseverance.

Moreover, growth-mindset people think differently about struggle and failure. For example, students who possessed a growth mindset in the Hong Kong study above would have welcomed the opportunity to strengthen their English fluency by engaging in the additional class offered by the university. Students with a growth mindset equated success with increasing their learning. In the same way, successful athletes like Patricia Miranda and Mia Hamm who possess a growth mindset were able to stretch beyond their natural talent due to their willingness to work harder to improve their skills (Dweck, 2006).

Furthermore, an educator with a growth mindset would significantly influence the school culture and challenge the accepted beliefs of intelligence. This educator would endorse five characteristics in their classroom environment: emphasizing the process of learning, setting high standards, creating a nurturing atmosphere, promoting hard work and effort, and developing persistence and resiliency (Dweck, 2006). These ideas do not align with the traditional view of ability and the entity-minded American school system. Thus, the traditional, accepted definition of intelligence must be reconsidered for a more encompassing definition from further review of the literature.

2.1.4 Redefining Intelligence

In the 21st century, the traditional notion of intelligence is being challenged to be less abilities focused and IQ-dependent (Costa & Kallick, 2000). Traditional views of intelligence allude to a "survival of the fittest" mentality solely based on aptitude for success. Today's world is much different from the world of Lord Kelvin, Charles Spearman and the noble aristocrats of the 1900s. The 21st-century workplace requires a new set of skills, not necessarily guaranteed by high intelligence. The intelligence of today is "… the habit of persistently trying to understand things and make them function better. Intelligence is working to figure things out, varying strategies until a workable solution emerges. Intelligence means knowing what one does or does not know and seeking new information, organized so that it makes sense and can be remembered. In short, one's intelligence is the sum of one's habits of mind" (Resnick, 1999, p. 40).

This more robust view of intelligence is referred to as socializing intelligence (Resnick, 1997). It brings into context the cognitive processes required to problem solve, to think critically

and to connect the knowledge gained to the individual's world. Children are socialized from birth as they "acquire the standards, values, and knowledge" of how to function in their society (Resnick, 1997, p. 9). Intelligence viewed in this manner does not result solely from formal education; rather, it is a product of interactions between the child and the world around them. Children must be in an environment that requires these processes regularly to develop a socialized intelligence that reaches beyond the idea that intelligence is simply an innate, static quality. When students view intelligence as a social construct, they will believe they have the right and obligation to understand things and make things work. They will believe problems are to be analyzed and solved and they are capable of solving them. They are equipped with a toolkit of problem -analysis tools and know how to ask questions and seek help. Finally, they have the habits of mind that will lead them to actively use the skills of analysis and strategies for acquiring information they have learned (Resnick, 1997, p. 6, 7). When these types of processes are not socialized in the child, they may not develop the habits necessary to recall them when needed (Resnick).

In the school environment, these qualities promoting socialized intelligence would include artifacts and behaviors exhibited by the educators and learners that demonstrate evidence of high "academic rigor, accountable talk by all participants, clear expectations, self-management of learning and learning as apprenticeship" (Resnick, 2001). Students in a

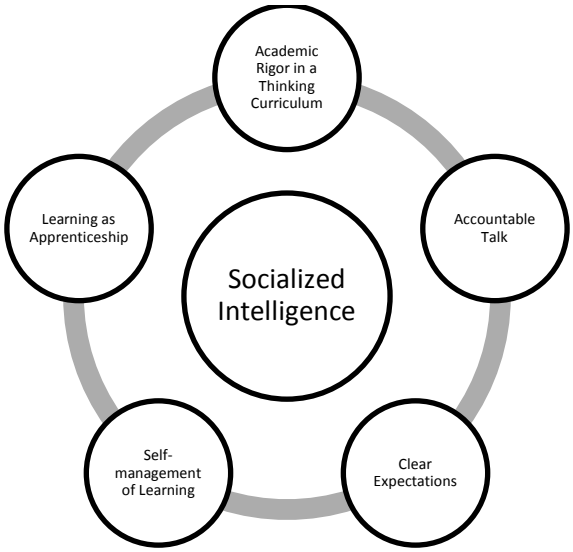

Figure 2: Supporting components of socializing intelligence classroom (Resnick, 2001)

socializing intelligence environment would perceive their mental work as required to increase their ability. They would integrate critical thinking and active use of their knowledge to develop new ideas and connections between information. The learners would be engaging in discourse with one another and their teacher. They would demonstrate their depth of understanding and use of the knowledge they have gained. Educators in this environment have established a clear understanding of what is expected and what good quality work looks like which challenges all students to take ownership of their learning. A student perception's of his own ability promotes autonomy and responsibility of his own learning and thinking processes. Students learn as apprentices, observing as the teacher engages them through modeling and cognitive activities. These school practices encourage socializing intelligence and thus result in a student who perceives herself as able to increase her ability through targeted effort (Resnick, 2000, p. 35).

Intelligence constructed in this manner directs us towards skills that might extend someone's intellect even though the skills are not "measured" on a test. Viewing intelligence through this lens promotes a positive relationship with the construct of effort by suggesting that

harnessing effort creates and builds capacity (Resnick, 1999). Moreover, "ability is a continuously expandable repertoire of skills that, through a person's efforts … grows incrementally" (Costa & Kallick, 2000, p. 3). Intelligence and effort in this new framework require educators, parents, and students to contemplate their own beliefs, mindsets, and assumptions about these constructs.

2.1.5 Ability and effort

Currently, our society polarizes the relationship between effort and ability. When students perform well on tasks in the classroom and seem to have this gift of effortlessly moving through assignments, they are thought to be highly intelligent. Meanwhile, students who perform well yet have to exert a great deal of effort to accomplish a task are thought to be less intelligent. As a result, effort and ability are viewed as being inversely related to each other. As one increases, the other decreases. Effort is necessary when a lack of intelligence is present. When ability is

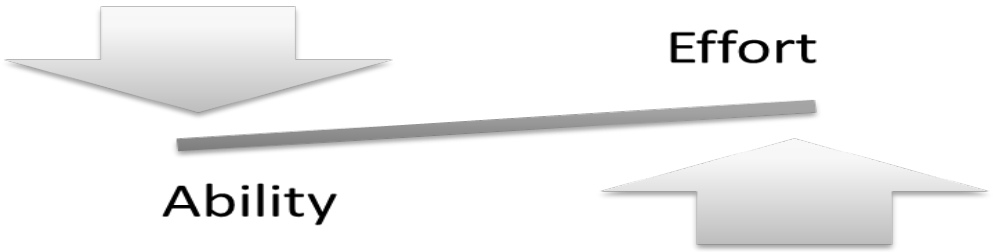

Figure 3: Effort vs. Ability

high, little or no effort is needed. Watterson illustrated this in his *Calvin and Hobbes* comic strip when Calvin's character comments that he used to think Susie was smart (Watterson, 1995). The extra effort Calvin's friend Susie is exerting to understand a concept is negates Calvin's previous

notion of her high intelligence. In contrast, this new understanding of ability challenges us to view effort as a vehicle to greater intelligence transcending the traditional view of intelligence and generating a new definition that captures more than just a written IQ test (Resnick & Hall, 1998).

Moreover, children in effort-based environments learn to persist and reason through difficult tasks and are willing to accept such challenges. Asian students perform much higher on standardized tests than American students, which is attributed to the educational philosophies associated with effort in Asian cultures (Resnick, 1997). Asian children "are typically socialized to espouse and act on the belief that high effort and perseverance are the keys to successful performance; indeed, perseverance is even a moral obligation" (Resnick, 1997, p.10). When children live and learn in environments that challenge and regularly engage higher-order learning, they develop cognitive strategies and effort based beliefs about intelligence (Resnick & Hall, 1998).

Classroom environments that promote metacognition and self-regulatory capacities lead students to believe they can be intelligent through effort and problem solving. Resnick and Hall believe "the paradox is that children become smart by being treated as if they are already intelligent" (p. 107). Students in this type of environment are learning to be smart; therefore, their self-perception of ability aligns with an incremental theory of intelligence. This environment is referred to as effort-based which reflects the following Principles of Learning: Clear Expectations, Academic Rigor in a Thinking Curriculum, Fair and Credible Evaluations, and Recognition of Accomplishment (Resnick, 2001). Students have clear expectations of what they are trying to learn and what high-quality work looks like. They also have the base

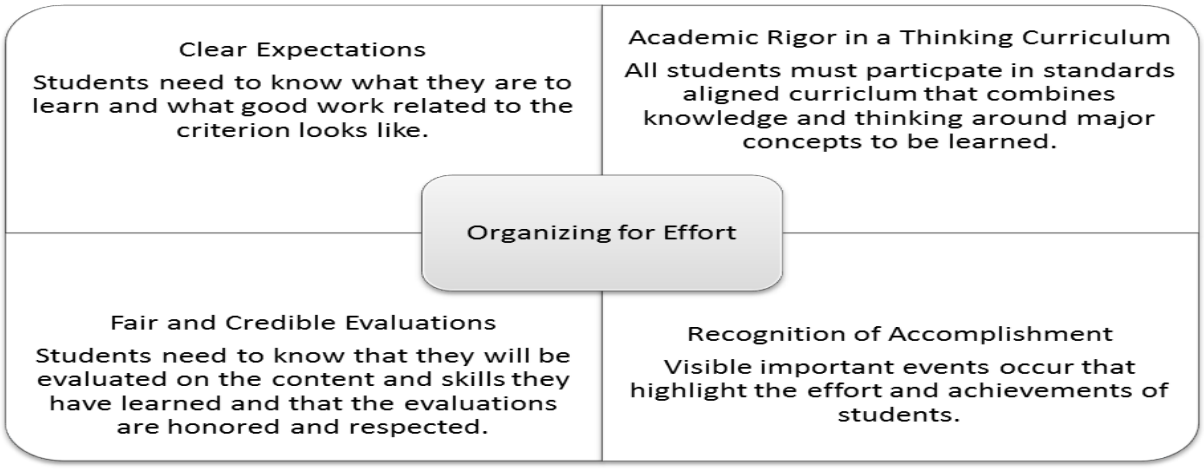

Figure 4: Effort Based Classroom Culture (Resnick, 2001)

knowledge needed to think deeply and reflectively about major concepts, empowering them to connect ideas and forge new constructs. These students know evaluation will be fair and consistent with their peers, making their assessments credible in the world around them. An effort-based environment also will provide students with the opportunity to celebrate the accomplishment of sustained and targeted effort, removing the focus on ability and/or lack thereof (Resnick, 2000, p.32).

The literature has provided a broader definition of intelligence and an understanding of the perceptions that influence our mindset as we approach learning and the school environment. The next section will review the literature regarding educator behavior in the classroom and how it impacts student ability.

2.2 EDUCATOR INFLUENCE ON LEARNER SELF-PERCEPTIONS

Along with societal perceptions of ability, as well as, the learner's own implicit theory of intelligence and mindset, the educator plays a significant role in further defining the student's beliefs about intelligence in the school setting.

2.2.1 Praise and Feedback

Children interpret and internalize the feedback they receive from parents and teachers through the lens of their mindsets (Dweck, 2006). Teacher feedback is key to a student's overall academic self-concept (Mueller & Dweck, 1998). Research involving a series of six studies and 128 fifth graders hypothesized that students praised for intelligence would have the tendency to select performance goals unlike those praised for effort who would more likely select learning goals. When they are praised for ability, students learn to connect their successes to how well they perform, which leads to performance-goal selection and a fixed mindset (Mueller & Dweck, 1998). Moreover, one of the individual studies investigated whether students praised for intelligence would be more likely to have an entity theory of intelligence or fixed mindset. When educators -- much like the parents -- used phrases such as "You got a high score; you must be smart," students leaned more toward the idea that their intelligence is fixed and stable as a result of the teacher's inferences regarding their ability. Thus, an educator may be conveying feedback that implies intelligence is fixed and unchangeable (Mueller & Dweck, 1998). When a parent responds to a child's A grade by commenting to the student, "You are so brilliant, you got an A without even studying (Dweck, 2006, p.169)," the message is meant to be supportive and self-esteem building by the parent. However, the message the child receives translates into, "I'd

better quit studying or they won't think I am brilliant" (Dweck, p. 169). This message, like the educator's message, confirms the fixed mindset view that performance is more important than actual learning. Furthermore, students with performance goal orientations tend to present a helpless response in the face of challenge to preserve their perceived level of ability (Dweck & Leggett, 1988). Additionally, the study demonstrated that when teachers give praise for effort, the result is learning-goal orientation, which leads to an incremental theorist view of intelligence or a growth mindset (Mueller & Dweck, 1998). A parent's response to his daughter who has just lost a gymnastics competition communicates a learning goal orientation when the parent tells her the winners have more experience and she will grow stronger with more hard work and experience as well. This response reinforces the message to work harder and learn more to achieve her goal in the future (Dweck, 2006).

"Process praise" and "person praise" are the two types of praise educators' use in the classroom. Students' interpretation of an educator's praise is linked to their perceptions of ability and their mindset (Dweck, 2006). Process praise is defined as praise for effort, perseverance, and strategy and ultimately fosters hardy motivation in students. Person praise is defined as praise for innate, natural ability or traits that are inherent and unchangeable (Dweck, 2006). In a study conducted in 1999, researchers were curious as to whether student responses to future setbacks were influenced by person praise in a previous scenario (Kamins & Dweck, 1999). The study hypothesis predicted that kindergarten students who received person-oriented feedback were learning that their competence and worth are determined by their performance. The students participated in four scenarios and rated themselves on being nice, good, and smart. Students who received praise for intelligence and personal traits rated themselves as less nice, less good and less smart than the students praised for their process or hard work. These students

believed that their self-worth was contingent on how good, nice or smart they were. Likewise, they demonstrated helpless reactions in each setback (Kamins & Dweck, 1999). Person praise indirectly promotes a fixed mindset in learners even when the giver of feedback may have the best of intentions.

Interestingly, one of the more common complaints heard in schools is that students are not motivated to perform. Over the past twenty years, parents have focused their efforts on maintaining their child's self-esteem in the face of failure: Everyone gets a trophy! Eighty-five percent of parents believe they must praise their child for how smart they are when they perform well (Mueller & Dweck, 1998). Consequently, these students have been raised in a time when they were praised for their personal traits such as intelligence and athletic abilities rather than the effort invested to achieve success. Students raised in this environment develop a contingent self-worth meaning that their self-worth is based solely on their last performance, which is also a characteristic of a fixed mindset (Mueller & Dweck, 1998, Dweck, 2006). These students are less motivated and are more concerned with maintaining their status rather than working hard to achieve a goal. They were less likely to remediate their situation and suffered a full complement of helpless reactions when they faced future setbacks (Mueller & Dweck, 1998).

Our public educational system has continually fed into the idea that intelligence is fixed and innate as evidenced by the use of testing to measure and/or predict future success of students. Educator feedback, perhaps unintentionally, has further promoted a fixed mindset in students who then become less and less motivated through years of schooling. Being praised for intelligence and personal traits cultivates students who have less persistence, lower expectations for themselves, decreased performance and a negative view of school (Mueller & Dweck, 1998). Furthermore, learners become disenchanted with school and their lack of achievement reflects

upon their experiences and creates a lack of engagement in a system that has crushed their persistence and creativity over time -- not necessarily their actual potential.

2.2.2 Student Engagement

Student engagement cultivated or minimized by the beliefs and actions of an educator can have a significant effect on student motivation. When teachers believe learning is about transmitting information, they will tend not to focus on relevance and student need. Yet, when the teachers view learning as a process of facilitating as students sift and sort information to develop their own understanding of material and connectivity to their world, the teacher's pedagogy becomes student-focused and based on the student needs. New knowledge acquisition or learning must be relevant to a student's world to have significance to the student (Willms, 2003). When the knowledge is relevant, students can digest the information and apply it more deeply. Students who view school as central to their future tend to have good relationships with peers and parents and they believe they belong at school (Willms, 2003). These characteristics lead to participation in academic and non-academic pursuits at school. The extent to which students identify with and value schooling outcomes and participate in academic and non-academic activities is called engagement (Willms, 2003, p. 8). The more students value success and have a sense of belonging to their school, the greater the academic achievement. Low-achievement results indicate withdrawal from school. Thus, school culture plays a significant role in student success. Teachers who approach learning with focus on student needs create an environment that inspires engagement and belonging among students (Willms). Recently, I attended a professional conference, the 2012 Western Pennsylvania Superintendent's Forum where a local school district presented gaming curriculum and non-traditional use of classroom space. A

student from the district shared how his teacher's new approach has created relevance and a sense of belonging in the school culture for him, which has led to greater engagement in all content areas on his part. Prior to this change, he viewed himself as insignificant and irrelevant to the high school environment. Thus, student learning must encompass more than just transference of the curriculum; it must also be relevant and engage the student (Willms). The environment an educator creates affects the degree to which students engage in the school setting (Briggencate, Luyten, Scheerens & Sleegers, 2012). Thus, the classroom environment and the school culture play an important role in framing the student's perception of his ability. A significant part of the school culture is goal orientation in the classroom. The next section of the literature review discusses this construct.

2.2.3 Goal Orientation

As described in an earlier section of the review of literature, goal orientation is linked to the theory of intelligence a person possesses which predicts their responses to failure; see Figure 1 (Dweck & Leggett, 1988). When a people possess an incremental theory of intelligence, they are learning-goal oriented and respond to failure with remediation (Blackwell et al., 2007; Dweck, 2006; Dweck & Leggett, 1988; Mangels et al., 2006). The entity theorists set performance goals and see failure as a lack of ability, which results in helpless responses to difficulty. Shim, Cho and Cassady (2013) investigated teachers' classroom-goal structures related to their implicit theories of student ability. The study hypothesized that teachers who possess mastery (learning) goal orientation and an incremental theory of student intelligence will positively correlate to mastery (learning) classroom goals reflective of the educator's beliefs. The results identified a strong relationship between an educator's goal orientation and the type of goal structure used in

the classroom; however, there was no statistical support for the teacher's implicit theory of student ability (Shim, Cho & Cassady, 2013). Nonetheless, as proven in Dweck's prior research, achievement-goal orientation is driven by a person's implicit theory of intelligence (Dweck, 2006). Additionally, this study considered two types of performance goals: performance-avoidance goals and performance-oriented goals. Performance-avoidance goals are goals that focus on avoiding poor performance (Shim, et al., 2013). It was found that educators who promote performance-avoidance goals and an entity theory of intelligence were less likely to be performance-goal oriented due to the need to reduce competition and comparison between students (Shim et al., 2013). These educators felt badly for poor performing students and tended to provide less challenging tasks to avoid more poor performance. Likewise, instructors with an entity theory of intelligence were more likely to consider counseling a student out of a difficult math course (Rattan, Good, & Dweck, 2012).

Goal orientation plays an important role in how educators approach students and the expectations they establish for students in the school environment. Furthermore, an educator's classroom environment has a strong influence on the goals students adopt (Anderson & Young, 1994). When educators choose to establish environments designed to promote meaningful learning around student interests, encourage positive peer relationships, and emphasize the intrinsic value of learning, students are more likely to adopt mastery goal orientations (Ames, 1992). These types of instructional strategies are echoed in Resnick's socializing intelligence environments as well as Dweck's characteristics of an effective educator (Dweck, 2006; Resnick, 2001). Educators who lean toward a mastery- or learning-goal orientation are more likely to endorse a growth mindset (Dweck & Leggett, 1988; Dweck, 2006).

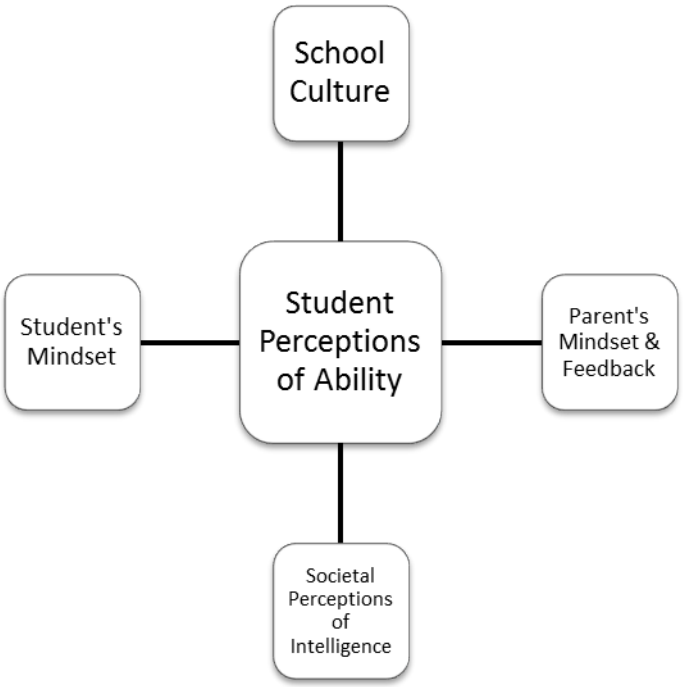

Figure 5: Components of a student's perception of ability

Throughout this section of the review of literature, I have discussed how student perceptions of ability are formed over time. These perceptions are the result of various interactions and experiences with the world around them. As parents prepare their children for the world, they model and set expectations; yet, few are cognizant of the need to establish a positive relationship between effort and ability, contrary to societal perceptions in America. Without realizing it, parents are influencing the mindset of their child based on their own mindsets. Likewise, school-age children enter an educational system that focuses on ability as the primary determinant in learning. Students in this environment are not asked to perform beyond their perceived capacity. This results in classrooms where children are not held responsible for higher levels of thinking leading to students who learn to accept they cannot handle such tasks (Resnick, 1997). It is plausible to think that these messages transmitted within a classroom setting between teachers and students are just as impactful on children as the

messages they receive from their parents. Likewise, educators establish their classrooms based on mastery or performance-goal orientation, which further communicates to the student the expectations of the class in relationship to the teachers' theories of intelligence. Students develop their own implicit theory of intelligence and mindset cultivated by their interactions with parents, teachers, other adults, and their community (Dweck, 2006). These combined elements create the formula for a student's perception of their ability, which will drive his individual academic success and motivation to achieve throughout a lifetime.

The next section of the review of literature will address the educator's beliefs and how they influence the actions and expectations, the educator launches in the school setting.

2.3 EDUCATOR BELIEFS AND BEHAVIORS

When students enter the educational setting, they bring along their own set of beliefs and preconceptions regarding the learning anticipated in the school setting. A student's beliefs "are the mental baggage they bring to the achievement situation" (Blackwell et al., 2007, p. 259). Just as student performance is influenced by the student's beliefs, preconceptions and implicit theories of ability, so is the educator's behavior in the school setting. Instructional design decisions, management decisions, moment-to-moment decisions, and so on, are all made through the lens of the educator's beliefs about teaching and learning. Beliefs, in a general sense, are defined as "a proposition which may be consciously or unconsciously held, is evaluative in that it is accepted as true by the individual, and is therefore imbued with emotive commitment; further, it serves as a guide for thought and behavior" (Borg, 2001, p. 186). Beliefs further narrowed in this context, are epistemic beliefs: beliefs about knowledge and knowledge acquisition (Schraw

& Olafson, 2002). Educators form these epistemic beliefs through a blending of personal experience in the classroom, their beliefs about student learning and how students learn, their implicit theories of ability and their beliefs about content and how it must be communicated and the culture of their environment.

2.3.1 Beliefs, Experience, and Content

An educators approach to teaching, cluttered with her experience, is unlike the lawyer or doctor who is new to their profession when they begin their practice. Educators carry with them experiences of years of instruction and examples of teachers and principals they have watched having personally spent thousands of hours in the classroom learning. This insider information convolutes the new learning and behaviors they could potentially glean. Their preconceived notions regarding their practice may damper the pedagogical strategies and new ideas they are experiencing as they prepare to teach. Often, educators will teach from a certain style because they find it comfortable for them and experienced success in it as students; thus, they teach as taught. There is "a strong relationship between teacher educational beliefs and their planning, instruction decisions and classroom practices" (Pajares, 1992, p. 326). Moreover, beliefs are static, representing external truths that remain unchanged regardless of circumstances although they are based on evaluation and judgment (Pajares, 1992, p. 326). Furthermore, teachers "form a highly personalized pedagogy -- a belief system that constrains the teacher's perception, judgment, and behavior" (Kagan, 1992, p. 74). Educators with similar knowledge about teaching and learning, teach differently because their beliefs are more powerful than their knowledge about teaching. This is evident in the following examples of science teachers who have similar knowledge about teaching and content. One teacher who believes that science is quantitative and

about reproducing effect will place a great deal of emphasis on arriving at the single, right answer and demonstrating scientific principle. Equally, the science teacher who believes science is for discovery will allow students to stumble around to find the answers and encourage student discovery of the scientific principle (Mansour, 2009). Likewise, consider the math teacher who believes math is about facts. She will focus on filling the students' minds with facts, requiring "plug-and-chug" methods to compute the correct answer (Pape & Hoy, 2002). Consider the social studies teacher who believes that history is about social construction. His approach to instruction will be more of a constructivist model, allowing students to analyze and synthesis the history to arrive at their own thoughts and conclusions (Pape & Hoy, 2002). Each of these examples demonstrates the idea that educators have specific beliefs about their content, how to teach it, and how students learn.

Beliefs are strongly associated with the instructional choices an educator makes (Stipek,

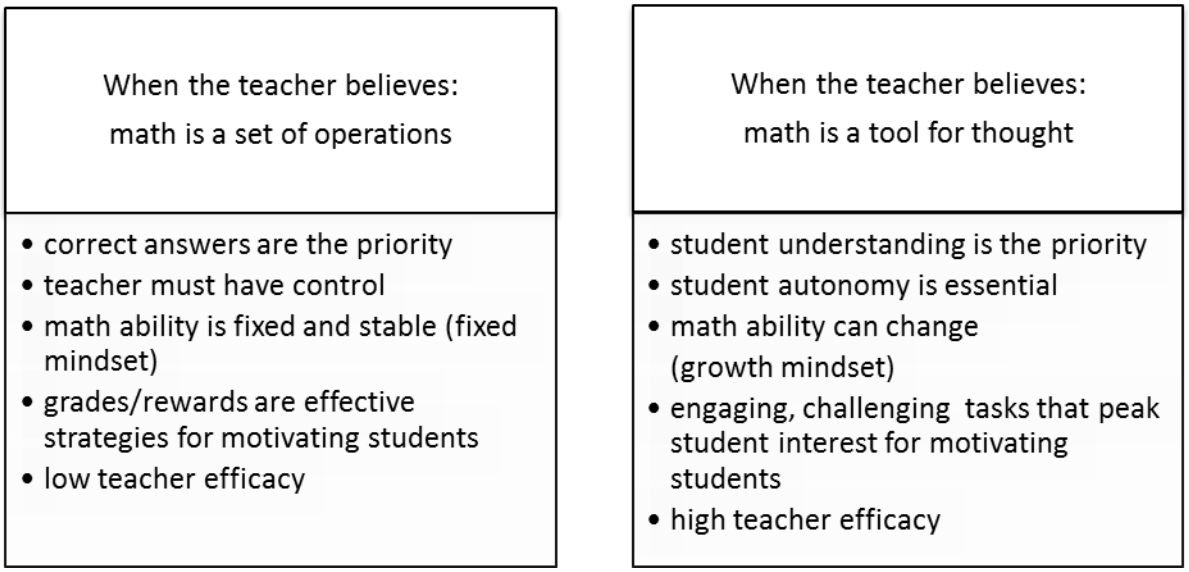

Figure 6: Teacher beliefs about math and instructional behaviors (Stipek et al, 2001)

Givvin, Salmon, & MacGyvers, 2001). For example, in Figure 6, teachers who believed math is a set of operations to be learned also believed students need to get correct answers; teachers need to have control over activities in the classroom; math ability is fixed and stable; and grades and rewards are effective strategies for motivating students in math (Stipek et al., 2001). These instructional practices are the preferences of an entity theorist whose approach to teaching is often teacher-centered and based on the belief that math intelligence is innate and fixed (Kuntze, 2011). On the contrary, teachers who believed math is a tool for thought also believed student learning should be focused on understanding students must have autonomy in completing tasks; math ability can change; and students will engage if tasks are interesting and challenging (Stipek et al, 2001). Likewise, teachers with a malleable view of math ability favor an inquiry-based approach (Kuntze, 2011). These studies further demonstrate how beliefs about content affect instructional decisions.

2.3.2 The Role of the Educator and Beliefs

In addition to content beliefs, an educator's view of her role in the classroom is an indicator of her beliefs about learning as well as teaching. Epistemological beliefs are defined as specific beliefs about knowledge and knowledge acquisition (Schraw and Olafson, 2002, p. 99). These epistemological beliefs are transformed into three worldviews, which frame the educator's approach to instruction as a realist, a contextualist or a relativist (Schraw and Olafson, 2002). A teacher with a realist worldview believes there is a finite core of knowledge being disseminated or transmitted to students via those who "know" or possess all the knowledge. Teachers are the "sages on the stage," sharing their vast knowledge with their pupils (Schraw & Olafson, 2002). This idea correlates to "transmissionist" who engages in the process of knowledge transmission

(Mansour, 2009). These educators see students as passive participants in their educational journey. They employ strategies like drill and practice along with norm-referenced tests and textbook-generated assessments.

Unlike the realist, the contextualist worldview places the educator as a facilitator in the classroom. The environment is constructed in a supportive way where students are encouraged to share ideas and generate knowledge. It ensures that new knowledge is gained through authentic life application and development of skills that will enable students to continue to acquire new knowledge on their own (Schraw & Olafson, 2002). Assessments in this frame are real-world and reflective of cooperative experiences in the classroom. Similarly, the third worldview, called the relativist, poses the teacher as a facilitator who provides a learning environment where students exercise defined autonomy, learn to think independently, and develop self-regulation skills (Schraw & Olafson, 2002). Assessment is criterion-referenced, driven to student needs. Student self-reflection is essential. The contextualist and relativist are both closely aligned with the constructivist teacher. Educators as constructivists are facilitators who guide learning and develop social relationships (Mansour, 2009).

Other factors influencing the teacher's view of her role in the classroom would include how the teacher mitigates instruction for students from multiple demographics and backgrounds. Often these students are believed to be non-conforming and unmotivated when they do not do well academically. If the teacher views herself as simply disseminating knowledge, she may not try to navigate these differences to ensure learning is occurring for all students. A recent study explored teacher "deficit thinking" (Nelson & Guerra, 2013, p. 70). This type of thinking causes a person to rely on her personal beliefs over her professional knowledge (Nelson & Guerra, p. 70) which can lead to assumptions in the school setting that are counterproductive for students.

For example, Nelson & Guerra found that the majority of teachers in their study had deficit thinking and little awareness of the culture in their classrooms. These educators demonstrated their deficit beliefs when asked to explain the differences in the final projects of diverse groups of students. The educators blamed family dynamics and practices for poor student performance rather than their own lack of awareness of the culture and background of their students. When approaching the role of an educator in the classroom, one rarely thinks about the demographics and backgrounds of those she serves. Furthermore, educators tend to label poor achieving students as unmotivated from families who do not value education (Nelson & Guerra, p. 89). These students are challenged to learn the content and, at the same time, conform to new cultural expectations at school (Nelson & Guerra). The educator's understanding of her role in the classroom is significant to encouraging all students to learn and have a sense of belonging in school.

2.3.3 Beliefs and Instructional Approaches

Further wrestling with this construct of teacher beliefs and finding little research regarding educator mindsets, leads me to deeper analysis of teacher expectations and what teachers believe about student learning. When a teacher believes that all students can learn and they are confident that they can fulfill a student's needs, learning occurs. When researchers correlated teacher expectations of achievement with the teacher's perceptions of individual student characteristics, it was confirmed that educators who have high expectations of all learners in their classroom also have positive perceptions of student attributes such as perseverance, independence, self-esteem, cognitive engagement, motivation, relationships with peers, participation in class, and so on (Rubie-Davies, 2010). These attributes correlate to high student achievement and the

constructivist approaches to instruction. Furthermore, these characteristics and the constructivist approaches to instruction lead to an incremental theorist view of intelligence (Rubies-Davies, 2010). Similarly, low-expectation teachers who view potential achievement as poor based on their expectations of students employ an entity theorist's view of intelligence. The educator believes she can have little impact on achievement and what a student is capable of learning is predetermined. Moreover, teachers who favor more control in class tend to hold to an entity theory of intelligence and have lower teacher efficacy (Stipek et al., 2001). Educators with high efficacy were more likely to view intelligence as malleable, which in turn influences their learner's self-perceptions in a positive manner, leading to increased student achievement (Stipek et al., 2001). Figure 7 below illustrates the concepts previously discussed in a visual manner.

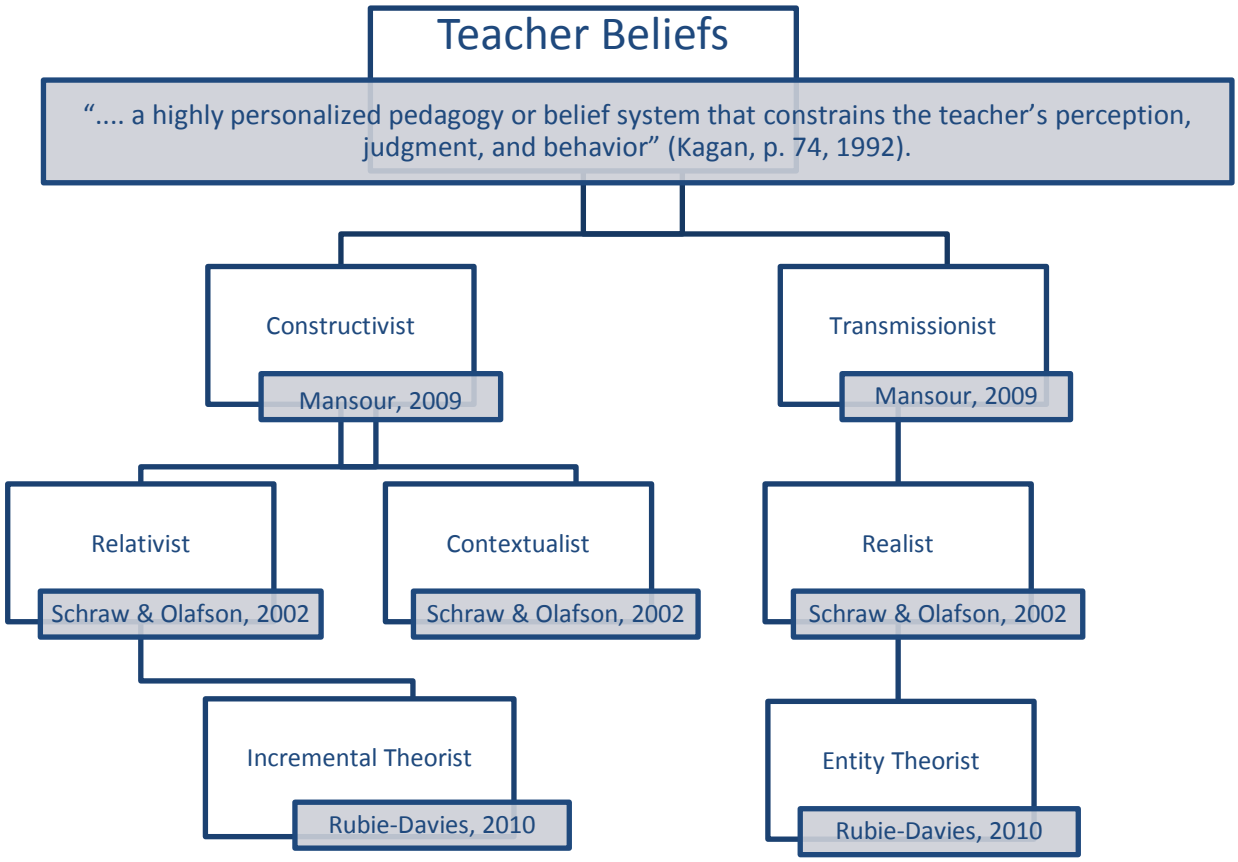

Figure 7: Teacher Beliefs vs. Approaches to Instruction, (Mansour, 2009; Schraw & Olafson, 2002; and Rubie-Davis, 2010)

Teachers, who possess a constructivist's point of view, as described by Mansour (2009), align to Schraw & Olafson's (2002) relativist and contextualist favoring instructional decisions that promote critical thinking, collaboration, and creative problem solving. These instructional practices become the chief pedagogy in the classroom. Educators with instructional practices that engaged student attributes such as independence, perseverance, and peer relationships had high expectations and therefore, were more likely to have an incremental view of intelligence (Rubie-Davis, 2010). Equally, teachers who choose to teach from a transmissionist's model lead to realist instructional practices such as drill and practice and teacher lecture, which would align to an entity theorist's view of intelligence. Teachers who believed student ability is fixed might

not use constructivist methods because they believed low ability students would not be able to use them effectively. Additionally, the more traditional a teacher's beliefs, the more he was focused on grades and correct answers in mathematics instruction (Stipek et. al, 2001).

In the moment-to-moment choices educators make in the classroom, much is indicative of their beliefs about learning and teaching, which they harbor deep in their pedagogical decisions (Speer, 2008). In this study, a teaching assistant's approach to instruction in study groups was observed with a focus on what drove his instructional decisions. Videotaped sessions were analyzed and follow up interviews with the teaching assistant were completed. The teaching assistant believed students should be independent, problem solvers who use resources effectively, while teachers are the guides who lead through questioning and scaffolding. Additionally, the teaching assistant believed students must own their learning by combining real-life experience with new ideas and noting significant relationships in the material. The teaching assistant allowed students to make mistakes while he asked questions. He led the students to the mistake in process rather than directly pointing out the mistake, thus demonstrating his belief that real understanding is obtained through the process of learning rather than getting the right answer. Through the instructional actions of the teaching assistant, a connection between teacher beliefs and pedagogical decisions in the classroom was made (Speer). The types of instructional practice described in this section align with the idea of socializing intelligence and the characteristics of an effective educator. The review of literature provides further information of the connection between educator beliefs and behaviors in the next section.

2.3.4 Beliefs in School Environment

Another caveat of educator beliefs comes from the culture of the school in which a teacher delivers her instruction, including expectations of school administration, mandates from the Department of Education and pressures from professional peers. These directives play a significant role in whether the teacher is able to deliver instruction based on her beliefs, or is hindered by the influences of other sources. For example, a teacher, who enjoys a collaborative classroom with discussion and activity, may be perceived by administration as lacking in classroom management. As a professional in situations like this, the teacher must filter her beliefs through the context of the environment. Similarly, "culture is a screen through which people view their lives and interpret the world around them. It is with this socially constituted nature of culture that beliefs play a role in filtering information and determining what is considered important and to be of value in the group" (Mansour, 2009, p. 32). A teacher will filter her own beliefs through the culture of the school and also evaluate the school culture based on her beliefs.

Likewise, our educational system tends to promote certain goal theories within the elementary and secondary levels. A study found that middle school educators tend to favor performance goals rather than learning goals, while elementary educators tend to lean more toward learning goals (Midgley, Anderman, & Hicks, 1995). When an educator favors learning goals, students will know that their teacher values effort, improvement, mastery, and understanding. Consequently, when the teacher endorses performance goals, students will acknowledge that a demonstration of perceived ability is foremost, and their ranking in relationship to their peers is the key to their success (Midgley et al., 1995). The school environment plays a significant role in how students respond to their own learning.

2.3.5 Beliefs and Efficacy

Moreover, the concept of efficacy plays an important role in a teacher's perception in the classroom. Self-efficacy is a belief in which a person has confidence that she is capable of producing the desired results (Ahmad, 2011). A person with high self-efficacy would also be determined and persistent. A person with low self-efficacy would have little perseverance in the face of difficulty. Self-efficacy plays a part in a educator's toolbox of beliefs. A "teacher's personal beliefs about their capabilities to help students learn" is thought of as teacher efficacy (Deemer, 2004, p. 74). A study conducted in 2011 involving 228 in-service teachers in Pakistan found that high educator efficacy predicts high-task motivation in teachers as well as an incremental theory of intelligence. Educators with low teacher efficacy were less motivated and attributed failure to lack of ability (Ahmad, 2011). When educators have high self-efficacy and teacher efficacy, they are most likely to improve student performance (Ahmad, 2011). Accordingly, teachers who possess a great deal of self-confidence in their own ability to teach mathematics correlates significantly with student perceptions of their own competence as mathematics learners (Stipek et al., 2001). Furthermore, the "teacher's level of efficacy related to theories of intelligence, suggests that teachers who feel confident about their teaching capabilities are more likely to believe intelligence is malleable" (Deemer, 2004, p. 87). More specifically, educators who have high efficacy also demonstrate mastery-oriented goals for learners in their classrooms; the more confident an educator is in their teaching, the more likely they believe in a growth mindset (Deemer, 2004).

Additionally, educators who believe intelligence is malleable also believe in the efficacy of their instructional methods (Leroy, Bressoux, Sarrazin, & Trouilloud, 2007). The higher the efficacy a teacher possesses, the more likely they choose instruction that promotes autonomy in

the students. An autonomy supportive educator is one who "seeks to identify students' inner motivational resources by creating classroom conditions favorable to meeting students' needs in a way that promotes internalization processes and enhances intrinsic motivation" (Leroy et al., 2007, p. 530). When educators believe that achievement can be cultivated through effort, they also believe in their own efficacy to increase student achievement. The results suggest that teacher beliefs about their student's ability can lead to certain teaching behaviors (Leroy et.al, 2007, p.530).

2.3.6 Beliefs and Stereotyping

As previously discussed, entity and incremental theorists judge their own performances in radically different ways. The incremental theorist tends to attribute success or failure to the amount of effort invested while the entity theorist tends to attribute their success or failure to the amount of ability possessed. This is also true of their judgment of others (Dweck, 1999). Another study involving second graders asked students to explain why their peers performed well on an assessment. The students had varying answers that indicated their implicit theory of intelligence. Students identified as incremental theorists were two times as likely to attribute scores to processes such as studying and practicing, rather than the student's intelligence (Heyman & Dweck, 1998). When asked to explain poor performance, the students identified as entity theorists were two times more likely to attribute poor performance to a lack of intelligence (Heyman & Dweck, 1998). Similarly, college students participating in a comparable study explained achievement through their lens of implicit theory. Entity theorists reasoned that performance was a result of intelligence, while the incremental theorists explained performance as the result of actions the student took to bring about good or poor performance such as how

much the student studied. Thus, "students theories of intelligence affect the way they see and react to their own successes and failures, and the way they see and react to other's successes and failures" (Dweck, 1999, p. 75). When observing the poor achievement of others, an entity theorist would view a student as "having low ability" and would have a "diminished belief in the student's capacity to learn" (Dweck, 1999, p. 76).

Furthermore, entity theorists tend to hold stronger stereotypes related to underlying character when observing the behaviors of individuals or groups. They tend to rely on little evidence for their stereotypes (Plaks, Stroessner, Dweck & Sherman, 2001). When educators have a diminished view of a student's ability, students are provided with an alternate curriculum aligned to their preconceived ability based on their past performance (Resnick, 1995). Thus, students become stereotyped and labeled as poor students. On the other hand, the incremental theorist would "focus on the student's effort and strategy and consider what kinds of instruction or remedial actions would help the students overcome their difficulty" (Dweck, 1999, p. 76). Incremental theorists also see the negative and positive behaviors of individuals or groups; however, they see the underlying explanations in a way that promotes growth rather than condemnation (Dweck, 1999; Plaks et al., 2001).

Furthermore, in an undergraduate math course, teaching assistants were asked about their future instructional intentions for individual learners after a poor assessment experience (Rattan et al., 2012). Teaching assistants holding an entity theory of math intelligence were more likely to label a student as poor, based on one performance (Rattan). Entity theorists were also more likely to comfort students who they believed had low ability and then chose instructional practices that reduced the student's engagement with the subject. Subsequently, the instructors even considered counseling students out of the introductory math course. Students receiving

comfort feedback were less motivated and engaged in the class (Rattan et al, 2012). The results of this study directly linked teacher perceptions of student ability and instructional decisions. When a teacher perceives a student as having limited ability, less rigorous instructional choices are considered, further confirming the claim that students with lesser ability are given less demanding curriculum (Resnick, 1995).

An educator's perceptions of student ability are significantly impacted by his or her individual beliefs. Teachers possess underlying beliefs formulated by their own classroom experiences as both learners and educators. Many of these presumptions become the lens through which they develop their student perceptions of ability. A teacher's grasp of content, an understanding of her role in the classroom, her belief in her own effectiveness as an educator, and implicit theory each play a significant part in sculpting the educator's expectations and goals. Thus, educators' perceptions of student ability, in theory, should be evident in the school environment they create.

We have reviewed theories of intelligence, how students develop their theories of intelligence, and how the beliefs of the teacher become manifest in their behaviors in the school setting. The next section turns our lens to the principals, their beliefs, and their roles in the school environment.

2.4 PRINCIPAL LEADERSHIP

When school administrators first became a part of the school system, they were *lead teachers* who assumed some administrative responsibility in the one room schoolhouse. Eventually they were called *principal teachers*, and as the demands of the role increased, they were called

principals (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Therefore, it is conceivable that the beliefs, theories of intelligence and perceptions principals possess are a result of the same influences and experiences they had as students and educators in the system. Just as these beliefs, theories of intelligence and perceptions guide teacher decisions in the classroom, they also will guide the decisions principals make to lead their buildings.

2.4.1 School Leadership and Student Achievement

Principal leadership is an integral part of the school environment. Research shows that school administrators can have a positive effect on student achievement (Hallinger & Heck, 1998; Marzano, Waters, & McNulty, 2005). In fact, principals are the second most important school community factor in students' academic progress (Leithwood et al., 2004, p. 3). Studies conducted by the Wallace Foundation indicate that even though school leadership does not directly affect student achievement, it does have a statistically significant indirect effect on student achievement (Leithwood et al., 2010, p. 7). School leadership focuses on two core purposes: to provide direction and to exercise influence within a balancing of stability and change as the organization moves forward (Leithwood et al., 2010, p. 7).

Various researchers have identified effective practices, core leadership strategies, leadership styles, and principal responsibilities that lead to an increase in student achievement. Many of these practices overlap and are similar in explanation. Ultimately, school leaders must possess a repertoire of tools that enable them to be flexible and adaptive in their positions and/or circumstances. Effective principals are able to manipulate the school environment to stimulate changes needed for improved student achievement.

> Leithwood et al. (2010) found that significant effects on student learning depend on creating synergy across a range of human and institutional resources, so that the overall impact adds up to something worthwhile. Among the many people who work hard to improve student learning, leaders are uniquely well positioned to ensure these synergistic effects (p. 7).

For example, a large school district may need a top-down leadership approach, while a small school district may not. A smaller school district may have more opportunity for modeling instructional practices, while a large school district may incorporate other employees to share the leadership required to accomplish this goal. Leadership roles in education necessitate flexibility, collaboration and the wisdom to discern which tools will maximize the academic growth of students and the professional growth of adults.

2.4.2 Key Roles of the Principal

Five roles of effective principal leadership have emerged throughout the Wallace Foundation research. These roles describe what effective principals do to raise student achievement: shaping a vision of academic success for all students; creating a climate that is hospitable to education; cultivating leadership in others; improving instruction and managing people, data, and processes (Wallace Foundation, 2013, p. 6).

Effective principals must set high standards for all students establishing a vision of academic success of every student. In the past, principals were seen as managers who focused on operations and helped students navigate their predetermined "track" to success. The general track was reserved for low-skilled students, while high expectations in the academic track were reserved for the college-bound. Fortunately, this idea has been thwarted due to the changing

needs of the global economy. A need for high expectations and a strong educational background for every student -- no matter the perceived ability -- are required for career success in a global economy (Wallace Foundation, 2013). The effective principal must lead instructional practices to ensure that all members of the school community understand the goal of academic success for all. The principal is leading for learning focusing on the school's academic capacity to raise student achievement (Hallinger & Heck, 2010).

The second identified role of an effective principal is creating a climate that puts learning at the center of the school environment. According to Sahin (2011), "School leadership is the most predictive dimension of school culture" (p. 1924). A healthy school environment is characterized by safety and orderliness as well as a supportive, approachable attitude toward children and a community of professionals focused on best practices (Wallace Foundation, 2013). Effective principals can overcome a negative environment wrought with pessimism, blame, and teacher isolation by cultivating an environment that focuses on professional community. The sociocultural context frames the leadership practice that is generated in the interactions of leaders, followers and situations (Spillane, Halverson & Diamond, 2001). Teachers in a learning-centered environment, along with their principal, will guide one another as they improve instruction and generate an upbeat, positive, welcoming, solution-oriented and no-blame atmosphere for all constituents (Wallace Foundation, 2013). This environment is focused on learning goals rather than performance goals resulting in a shared responsibility and accountability for the quality of learning. When teachers view their principal as development-oriented or mastery-oriented, the principal creates an environment that plays an important role in the improvement of teacher work (Bruggencate et al., 2012). In turn, the environment the

teacher creates affects the degree to which students enjoy or become engaged in the school setting (Briggencate et al.).

Another key role for the principal is cultivating leadership in others. Effective organizations do not rely on the efforts and work of one single individual. Success is driven by a compilation of the leadership of various members across the organization. This type of leadership is referred to as distributed leadership. It looks not solely at what the leader does, but rather the how and why of leadership practice stretched over the organization (Spillane et al., 2001). The "leadership practices (both thinking and activity) emerge in and through the interaction of leaders, followers and situation" (Spillane et al., 2001, p. 27). A principal who practices this type of leadership would be considered a Level-5 leader in Jim Collin's book entitled *Good to Great*. The culture of distributed leadership established by the Level-5 leader remains strong after the leader has exited the organization (Collins, 2001). Furthermore, principals who understand this concept create an opportunity to develop leaders through a strong culture of collaboration and professional community. This type of culture is linked to higher test scores in math (Wallace Foundation, 2013). Thus, when leadership is distributed throughout all levels of the organization, student achievement in math and reading rises (Wallace Foundation, 2013).

The fourth crucial role of an effective school administrator is improving instruction. Effective principals require teachers to use research-based strategies, collaborate, and initiate discussions regarding learning with their peers (Wallace Foundation, 2013). They spend time in the classroom providing feedback to promote growth in student learning and adult learning. Interestingly, when teachers were asked to rate their principal's effectiveness, principals who scored high in effectiveness gave very different reasons for classroom visits than their lower

scoring counterparts (Wallace Foundation). High-scoring principals made visits to classrooms to make formative observations and provide constructive feedback in assessing learning and professional growth of the teachers. Low-scoring principals planned their visits in advance and provided little to no feedback on informal visits (Wallace Foundation). The learning-centered principal is more concerned with cultivating leadership among the teachers and improving their practices.

Lastly, the principal must be a good steward of resources and processes. Principal "leadership involves the identification, acquisition, allocation, coordination, and use of social, material, and cultural resources necessary to establish the conditions for the possibility of teaching and learning" (Spillane, Halverson & Diamond, 2001, p. 24). This includes creative use of time, money, people, and data to reach building goals. Great managers also press issues of inadequacy and through careful documentation, weed out ineffective employees and processes. She sets rigorous goals, encourages, supports, advocates, expects, and monitors progress (Wallace Foundation, 2013).

2.4.3 School Leadership and School Culture

As the leader of the school, the principal will establish the school environment based on her interactions with staff and students. Organizational culture is cultivated by management (Niemann & Kotze, 2006); therefore, how the principal operationalizes the five key roles becomes evidence of the leader's implicit beliefs or mindset. The subsequent atmosphere created by school leaders will shape how the faculty portrays itself, how they perceive themselves, and how they behave toward one another (Murphy & Dweck, 2009). Likewise, the environment an organization establishes endorses a certain culture that will be reflective of an

implicit theory of intelligence (Murphy & Dweck). The principal brings to the school leadership role the same beliefs she applied to her classroom as a teacher. Her implicit theory of intelligence or mindset will permeate throughout each role the principal plays. For example, a principal who possesses a growth mindset would establish a culture in which the process of learning would be the priority. Accordingly, a fixed-mindset principal would establish a culture in which performance or grades would be the indicator of success. When working in an entity or fixed-mindset environment, people will present their smarts to be accepted in the group. Achievement, grade point average, SAT scores, and IQ become the most significant measures of success (Murphy & Dweck). In this environment, the organization's lay theory of intelligence affects the characteristics perceived to be more valued in a setting and influences people's behavioral displays (Murphy & Dweck, 2009, p. 284). Likewise, "an entity environment might cause people to ignore, avoid, or abandon potentially valuable learning opportunities" to maintain their perceived smarts (Dweck & Leggett, 1988; Nussbaum & Dweck, 2008). In contrast, a principal who possesses a growth mindset would lead others to value motivation and a passion for learning generating a culture of learning and professional community, leading to higher academic achievement. Environment shapes how people function in their jobs (Murphy & Dweck, 2009); therefore, in the school setting, principal leadership affects teacher behavior, which ultimately influences student performance.

2.5 CONCLUSION

The review of literature has provided a foundation for my understanding of implicit theories of intelligence, student perceptions of ability, and educator beliefs. Societal influences play a larger role than I ever imagined in our understanding of intelligence. These influences are deeply rooted in the parental messages sent to children before they even step foot into formal education. Our formal education system tends to lean toward an entity theory of intelligence, as evidenced by honor rolls, class rank, and performance goal-oriented secondary education entities. It seems as though educator beliefs dictate much of what happens in the classroom and the school. The beliefs educators possess around the content they teach; their ability to teach the content; student learning and the environments in which they work all play a part in who teachers become as an educator. The practices of teachers and school leaders are vetted from years of experience as students, teacher pre-service training, in-service training, and beliefs about student learning and content, all of which are filtered through the school's culture. An educator's daily practice and behavior in the school setting is a window into the educator's beliefs and theories of intelligence.

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The educators in the school setting set the tone for the students. From the classroom to the principal's office, a certain culture permeates the building based on the beliefs and practices of the professionals who work with the students. Dr. Carol Dweck's work on mindsets and the decades of prior research on implicit theories of intelligence laid the foundation for inquiry into the educational realm (Blackwell et al., 2007; Dweck, 2006; Dweck & Leggett, 1988; Hong et al., 1999; Kamins & Dweck, 1999; Mangels et al., 2006; Mueller & Dweck, 1998). The review of literature reveals research on student mindsets and implicit theories of intelligence in the education arena. However, the literature does not investigate the mindsets of school leaders or align their behaviors to the characteristics of an effective educator, as identified by Carol Dweck.

Our system of education is built upon the entity theory of intelligence, which results in a focus on performance, rather than the process of learning (Resnick, 1995). Entity theorists or fixed mindset educators are more likely to predict future poor performance based on one incident of poor past performance (Plaks et al., 2001). The resulting stereotyping in the classroom leads to less-challenging instructional experience for some students versus other students. Entity theorists provide students with teacher-centered classroom experiences rather than the autonomy an incremental theorist or growth mindset instructor might provide (Leroy et al., 2007). A small

sample of research has focused on the teacher's implicit theory of math intelligence. A teacher who believes math ability is innate will choose future instructional practices within the lens of her belief, resulting in instructional choices that may limit a student based on one poor performance (Kuntze, 2011; Rattan et al., 2012; Stipek et al., 2001).

Likewise, the literature provides a framework for the types of instructional practices a teacher with high efficacy and high expectations might employ. These teachers have greater motivation for student learning due to their beliefs that they are capable of affecting academic growth in their students (Ahmad, 2011). Additionally, these educators engage students by setting high expectations in their classroom, validating certain student attributes, and thus promoting an incremental-theorist viewpoint (Rubie-Davis, 2010). Teachers who have high efficacy and high expectations are more likely to try multiple approaches to assist a student in understanding a concept than their low-efficacy, low-expectation, entity peers.

Although the literature does not specifically discuss the mindsets or implicit theories of intelligence an educator possesses, it does align educator beliefs, in general, with preferred broad instructional approaches. For example, a teacher's epistemological beliefs and worldviews translate into instructional designs that define his or her approaches to learning and teaching (Schraw & Olfason, 2002). An educator's behavior in the classroom can be linked to their fundamental beliefs about teaching and learning (Sosu & Gray, 2012; Speer, 2008). Further research has identified the teacher's classroom goals as an indicator of the teacher's preference of instructional strategies and the teacher's personal goals (Deemer, 2004; Shim et. al, 2012). For example, an educator who establishes classroom goals that value mastery of learning over competitive performance tends to believe that learning and understanding of concepts are more

beneficial than grades. These teachers also value their own professional development and set learning goals for themselves.

Much of the research prior to 2000 involving implicit theories focused on students' perceptions of their own ability and their responses to adversity within those perceptions. Additionally, the research encompassing teacher beliefs related mainly to content beliefs, school environment and culture, epistemological beliefs, and types of pedagogy, rather than the teacher's individual implicit theory of intelligence. Additionally, the literature does not address the implicit theories of intelligence that school leaders possess. Instead, the literature moves through various practices and strategies typically employed by effective principals. The research does not link the school leader's practices to their mindsets (See Figure 8).

Figure 8: Purpose of the study

Therefore, this study is designed to gain perspective on the mindsets principals possess and to understand how principals operationalize their beliefs within their building and school culture. The findings of the study will begin to address the gap in the literature by adding foundational knowledge aligning principals' mindsets and their preferred practices in their leadership roles. This chapter discusses the problem statement, research questions, theoretical

framework for the research, research design, recruitment method, data collection details, data analysis procedures and limitations.

3.2 STATEMENT OF THE PROBLEM

Educators approach the school environment each day with their own set of beliefs and mindset. These beliefs and mindsets dictate how educators and students interact with each other, their peers, and the school environment. Similarly, these beliefs influence how the educator embraces new initiatives and professional development. Understanding how these mindsets influence our work is essential to informing educational practice and overcoming some barriers that may hinder student achievement. Since little or no research exists to address the mindsets of school leaders and their preferred practices, this study will begin to address the gap in the literature and be exploratory in nature.

3.3 RESEARCH QUESTIONS

The research questions will drive the research design and data collection. According to Yin (2003), "sharper and more insightful questions" result from a thorough review of the previous research investigations (p. 9). My research will be guided by the questions below:

1. What theories of intelligence, formal or informal, do building level principals in a regional sample report?

2. What demographic variables contribute to the differences among principals?
    a. How do principals differ in self-reported, informal or formal, theories of intelligence?
        i. Building level
        ii. Sex
        iii. Years of service in administration
        iv. Longevity in current position
        v. Certification areas
3. What specific practices do principals use to operationalize their self-reported theory of intelligence in their leadership roles?

3.4 THEORETICAL FRAMEWORK

The proposed study will explore principal mindsets and relate them to their preferred instructional environments. Decades of research involving implicit theories of intelligence have led to the development of the growth mindset and the fixed mindset (Dweck, 2006). Within her book, Mindset: The New Psychology of Success, Dr. Dweck identifies the qualities of an effective educator. She posits that great educators and great parents practice the same strategies. "Great teachers believe in the growth mindset of intellect and they are fascinated with the process of learning" (Dweck, p. 188). They provide high standards, a nurturing atmosphere, are not afraid of hard work and effort, and practice persistence and resiliency (Dweck, p. 188). These constructs are not only representative of the work of teachers, parents, and coaches but

they also are representative of educators across various roles in a school setting. My research will apply these concepts specifically to school level leadership.

Principals are the lead educators in a building and provide instructional leadership and expectations for the educators under their supervision. As discussed in the review of literature, there are five key roles of the principal identified by the Wallace Foundation. Although each area is equally important to the principal role, my study will not focus on two of the roles: cultivating leadership in others and managing people, data, and processes to foster school improvement (Wallace Foundation, 2013). These two roles are focused on the management role of the principal and are outside the scope of my investigation of mindset and principal instructional practices. Therefore, I will concentrate on the three key principal roles that tie more closely to instructional practices: shaping a vision of academic success for all students; creating a climate that is hospitable to education; and improving instruction (Wallace Foundation). Building-level leaders establish a school's culture through their actions and behaviors (Sahin, 2011). The way principals operationalize these key roles demonstrates their beliefs about school, students, staff, and their own efficacy as educators.

Likewise, as principals carry out their work, their mindset becomes manifest in the instructional practices they endorse. The Principles of Learning highlight instructional environments that demonstrate a belief in malleable intelligence. By definition, the Principles of Learning are a compilation of years of research intended to inform educators about best practices and habits, which result in high student achievement (Resnick, 2001). The review of literature revealed that constructivist instructional approaches align with the growth mindset while the transmissionist's approach aligns with entity theorists or a fixed mindset (Figure 7). Thus, for the growth-mindset educator, intelligence becomes much more than an innate ability to think

quickly and stockpile bits of knowledge (Resnick, 2001). Intelligence becomes a set of problem solving and reasoning capabilities that people can learn to use regularly to increase their achievement (Resnick). When educators expect students to use skills of intelligent thinking and hold them accountable for using them, students can learn intelligence (Resnick). This view of intelligence is referred to as socializing intelligence within the Principles of Learning framework. Socializing intelligence believes that you have a right and obligation to understand the world around you; you are responsible for learning and using a set of problem solving and reasoning skills that serve as your toolkit of strategies; and, in the face of failure, you find help to expand your knowledge (Resnick & Nelson-Le Gall, 1997, p. 6-7). When children are taught to believe their intelligence grows and changes through persistence and hard work, through trying new ideas, and through processing information and working through potential solutions to find the best answer, they acquire habits of mind that enable them to increase their ability.

Parallel to this construct of socializing intelligence are the key roles of the principal and the characteristics of an effective educator. As the leader of the school, the growth-mindset principal lays a foundation of malleable intelligence and promotes instructional strategies that engage students in learning habits of mind that increase their intelligence. Table 1 aligns the six characteristics of an effective educator (Dweck, 2006) and the descriptors of Socializing Intelligence within the Principles of Learning framework (Resnick, 1999) with the three key roles of the principal.

Table 1: Alignment of principal roles and identified practices of the growth mindset educator

Role of the Principal (Wallace Foundation, 2013)	Effective Educator Characteristics (Dweck, 2006)	Socializing Intelligence Descriptors (Resnick, 1999)	Research Connections from Review of Literature
Shaping a vision of academic success for all students	Growth mindset	Genuine effort creates ability.	Resnick & Hall, 2000; Kamins & Dweck, 1999; Dweck, 2006; Dweck & Legget, 1988
Improving instruction	Process of learning emphasized	Learners acquire and use strategies for learning and problem solving.	Dweck & Grant, 2003; Kallick & Costa, 2000; Resnick, 1999; Midgley, Anderman, & Hicks, 1995; Deemer, 2004
	High standards	Educators hold learners accountable for using learning, problem solving, and helping strategies.	Dweck & Leggett, 1988; Rattan, Good & Dweck, 2012; Mangels et al., 2006
Creating a climate that is hospitable to education.	Nurturing atmosphere	Educators communicate to all learners that they are able to grow through their persistent use of strategies and by reflecting on their efforts.	Rattan, Good & Dweck, 2012; Mueller & Dweck, 1998; Kamins & Dweck, 1999; Kuntze, 2012
	Hard work and effort	Learners regularly expect to do better than before. Learners are persistent when working on challenging problems.	Mueller & Dweck, 1998; Resnick, 1995; Hong et al., 1999
	Persistence and resiliency	Learners acquire and use strategies for appropriately getting and giving help in learning.	Mangels, et al., 2006; Dweck, 2006; Blackwell, et al., 2007; Hong, et al., 1999; Resnick, 1999

The first key role of the principal I have identified for my study is the shaping of a vision of academic success for all students. This role aligns well with the construct of the growth mindset, which is the ideal mindset for an educator (Dweck, 2006). The growth mindset believes

intelligence is malleable. Likewise, the concept of "genuine effort creates ability" aligns with a belief in malleable intelligence (Resnick, 1999). As described in the review of literature, people who hold a growth mindset are more likely to view the world as full of learning while failure is attributed to lack of effort not ability (Dweck & Leggett, 1988). Educators who believe in malleable intelligence do not measure learners by their last performance (Dweck, 2006; Kamins & Dweck, 1999). Thus, it is plausible to expect a school-level leader with a growth mindset to promote practices that emphasize effort and hard work.

The second role of the principal I have chosen to focus on is improving instruction. Two of the characteristics of an effective educator -- emphasizing the process of learning and establishing high standards -- align well with the "improving instruction" role of the principal. A growth-mindset individual is more likely to set mastery or learning goals than her fixed-mindset peers are. Learning is the focus, rather than a letter grade or performance. A person's implicit theory of intelligence or mindset dictates the types of personal goals they maintain (Dweck, 2006; Dweck & Leggett, 1998; Grant & Dweck, 2003). Thus, educators operating from a growth mindset would align with the belief that learners must possess habits of mind. These habits of mind lead to building strategies for learning and problem solving, which are evidence of a socializing intelligence environment (Kallick & Costa, 2000; Resnick, 1999). Additionally, this environment challenges learners to be responsible and accountable for using learning, problem solving and helping strategies (Resnick, 1999). These skills are the habits of mind that learners engage to see genuine effort improve their ability. Educators who embrace classroom practices in which students are accountable for their own learning are more effective (Dweck, 2006; Dweck & Leggett, 1988; Rattan et al, 2012; Resnick, 1999). For example, when a student does not do well on a mathematics assignment, the expectation would be for the student to

receive additional help on the concept and redo the assignment rather than accept a poor grade. Educators with high standards would also promote multiple learning strategies and a culture that permits students to have multiple opportunities to learn and receive further assistance (Mangels, Butterfield, Lamb, Good & Dweck, 2006). Principals who promote high standards and emphasize the process of learning improve instructional practices (Wallace Foundation, 2013).

The third principal role on which my study will focus is creating a climate that is hospitable to education. This role aligns with three of the characteristics of an effective educator: creating a nurturing atmosphere; valuing effort and hard work; and building persistence and resiliency (Dweck, 2006). This atmosphere, created by the educator's actions and practices in the room, is evident in the educator's recognition of hard work and effort. It is an environment where all learners believe they are competent and capable of learning much more (Resnick, 1999). The educator's use of praise focuses on process rather than ability. For example, when a learner does well, the educator says phrases like, "Your hard work really paid off" or "I really like how hard you worked to achieve your high score." This type of praise leads the learner to connect their success to their hard work (Dweck, 2006; Kamins & Dweck, 1999; Mueller & Dweck, 1998; Rattan, et al., 2012). Additionally, learners engage each other and the teacher in meaningful ways to enhance the learning process (Kuntze, 2011). This establishes an environment in which all learners have a sense of belonging; have knowledge to contribute; engage in rigorous thinking; and learn the knowledge core (Resnick, 1999; Wallace Foundation 2013). Moreover, educators with a growth mindset establish learning-goal environments that challenge learners to realize that effort is more essential than ability (Hong, Chiu, Dweck & Derrick, 1999; Mueller & Dweck, 1998; Resnick, 1995). The classroom environment is one in which the learners expect to improve their learning with each task presented (Resnick, 1995).

The culture celebrates effort for completing challenging tasks and is accepting of multiple strategies to arrive at the same answer. These practices recognize accomplishment and encourage collaboration, critical thinking, and problem solving. Learners use multiple strategies to persevere through difficult tasks and are not afraid to ask for help when needed (Blackwell et al., 2007; Dweck, 2006; Mangels et al., 2006). They choose remediation when facing failure as well as attributing failure to lack of effort (Blackwell et al., 2007; Dweck, 2006; Hong et al., 1999; Resnick, 1999). These strategies are also the habits of mind referenced in the definition of socializing intelligence. These are the strategies used when students face difficulties, yet, strive to overcome due to their obligation to understand and contribute (Resnick & Hall, 2000).

The key roles of the principal, the characteristics of an effective educator and the descriptors of socializing intelligence intertwine and are representative of each other. Through the key roles of the principalship, school leaders demonstrate their mindsets and promote specific instructional strategies and best practices. Furthermore, it is reasonable to use the Principles of Learning identified in a socializing intelligence or growth mindset environment to describe the school leader's practices of instructional leadership. "In a school whose leaders were committed to the notion that targeted effort can create intelligence, the Principles of Learning would be at work, and all would be consistent with the idea of Socializing Intelligence" (Resnick & Hall, 2000, p. 6). Thus, school leaders who believe intelligence is malleable would likely exhibit practices aligned with socializing intelligence as well. Furthermore, these practices would be revealed in the key roles principals play in the school setting each day.

3.5 RESEARCH DESIGN

The researcher must consider the purpose of the study, the types of data needed and the types of design options available when developing a research plan (Mertens, 2010). The purpose of the study is to investigate the theories of intelligence, formal or informal, that principals possess; to identify demographic characteristics among principals, related to their formal or informal theories of intelligence; and to investigate specific practices that principals use to operationalize theories of intelligence in their leadership roles. Due to the lack of research associated with my topic, my study will be exploratory. An exploratory study is most appropriate when the researcher is exploring a new idea, observation, or interest (Babbie, 2007). The survey participants will provide information via questionnaire from individual people allowing the researcher to analyze relationships between variables. The data collection method is efficient, is cost effective and will assist the researcher in laying a foundation for subsequent study of this topic.

3.5.1 Survey Design

From the review of literature, two relevant survey measures were discovered: one is designed to identify a person's implicit theory of intelligence or mindset (Dweck, 1999), and the other, identifies specific practices of teachers as they employ their beliefs about student learning in the classroom (Midgley, Maehr, Hruda, Anderman, Anderman, Freeman, Gheen, Kaplan, Kumar, Middleton, Nelson, Roeser & Urdan, 2000). Portions of both surveys will be used along with relevant demographic items to ensure that research questions are appropriately addressed. One part of the survey will ask for demographic information including participants' (1) building level,

(2) sex, (3) years of service in administration, (4) longevity in their current position, and (5) the content areas in which they are certified. The survey will use check boxes to indicate the best answer; however, years of service will be requested as a whole number entered into a text box.

The remaining portion of the survey will be adapted from the measures found in the review of literature. Carol Dweck has generated a survey intended to identify the mindsets of individuals or groups of people from an individual's perspective thus categorizing each participant's mindset. The survey, *Theories of Intelligence Scale-Others Form for Adults* (Dweck, 1999, p. 178), will be adapted to reflect the educator's view of a *learner's* intelligence. (See Appendix A for permission to use/adapt.) The original survey is contained in the appendix of Dweck's book, *Self-Theories: Their role in Motivation, Personality, and Development*. The scale measures the implicit theories of intelligence participants believe about other people's intelligence specifically. The survey includes eight-items in a Likert scale with a range of one to six (*1 = Strongly Agree, 2 = Agree, 3 = Somewhat Agree, 4 = Somewhat Disagree, 5 = Disagree, and 6 = Strongly Disagree*). The *Theories of Intelligence Scale* includes four entity theory items and four incremental theory items (Dweck, 1999). When this scale was originally developed, it contained only entity items. The belief that incremental items were more socially acceptable drove the decision to use entity items alone early in the research (Dweck, 1999). However, over time, it was demonstrated that well-crafted incremental theory items were as valid as the entity theory items. Therefore, several studies provide evidence of the validity of the *Theories of Intelligence Scale* used as an eight-item scale or as an entity-only scale (Dweck, 2006). It was found that a sample of 134 participants who took the entity-only items scale and the newly developed eight item scale resulted in a correlation of .88 (Dweck, Chiu & Hong, 1995). The data showed that 91.5% of the participants who were identified as entity theorists on

the entity-only survey were also classified as entity theorists on the new eight item survey (Dweck et al., 1995). Likewise, those participants identified as incremental theorists on the entity-only item survey were identified the same on the new measure at rate of 90.6% (Dweck et al., 1995). The eight-item survey was used after validity tests by Levy and Dweck in 1997, who reported a high internal reliability with Cronbach's alpha ranging from .93 to .95 (Levy & Dweck, 1997). In several subsequent studies including one with Levy, Stroessner & Dweck, the measure was used to identify participants' implicit theories. Again, high internal reliability was found at .93 (Levy et al., 1997). The *Theories of Intelligence Scale*, entity-only or full item measure typically results in 40-45% of participants found to be entity theorists, while 40-45% are found to be incremental theorists (Dweck, Chiu & Hong, 1995; Levy, Stroessner & Dweck, 1998). Remaining participants fall somewhere in between.

Dweck cautions researchers about using the eight-item survey in two situations (1999). One is when surveying children who may be confused by the repeating terminology; she recommends separating items on two different pages to lessen the confusion. The other is when conducting longevity studies where the survey may be used more than once in a short period. Additionally, the *Theories of Intelligence* scale has been evaluated to ensure that promoting an incremental theory of intelligence is "not a reflection of social desirability tendencies" (Dweck, et al., 1995, p. 326). For the purposes of my study, I am choosing to use the entity-only version of the *Theories of Intelligence Scale-Others Form for Adults* (Dweck, 1999) because of its shorter length and to avoid the likelihood that school administrators may lean toward incremental items on the eight-item *Theories of Intelligence* scale. Prior research confirms that the eight-item and entity-only survey results are consistent and interchangeable (Dweck, et al., 1995; Levy, et al, 1997). The original survey items have been adapted to reflect the participants' beliefs about

the intelligence of the learners. Additionally, the items have been reversed for consistency in Likert scale format. See Appendix B for the adapted survey.

In addition to the *Theories of Intelligence Scale*, I will be using portions of the *Patterns of Adaptive Learning Strategies* (PALS) survey (Midgley, Maehr, Hruda, Anderman, Anderman, Freeman, Gheen, Kaplan, Kumar, Middleton, Nelson, Roeser & Urdan, 2000) designed to examine the relationship between a teacher's learning environment and student motivation in the classroom through the lens of goal-orientation theory. The survey consists of three scales devoted to the teacher's *Perception of the School Goal Structure for Students*, their goal-related *Approaches to Instruction* and *Personal Teaching Efficacy*. Permission to use the *PALS* was granted electronically through the University of Michigan website (See Appendix C). For the purposes of my study, I will use the *Perceptions of the School Goal Structure for Students: Mastery Goal or Performance Goal* and *Approaches to Instruction: Mastery Approaches or Performance Approaches* scales. These scales have traditionally been administered to teachers; however, in my study, they will be presented to school leaders. The *Perceptions of School Goal Structure for Students* portion will assess the principal's perceptions of the goal structure of the school and whether the student's purpose for engaging in academic work is related to a desire to be competent or to demonstrate their competence. The *Approaches to Instruction* scale will assess the strategies the principal identifies as necessary to convey the purpose of engaging academic work. See Appendix D for scale summaries and descriptive statistics from the University of Michigan. Each scale is measured on a 5-point Likert range (*1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Agree, 4 = Agree, 5 =Strongly Agree*). In addition, I have modified the wording of the questions originally intended for teachers to reflect the

principal's perception of his or her building. See Appendix E for a matrix of these modifications.

These two scales will provide appropriate data points to address the proposed research questions. The *Theories of Intelligence Scale* will identify the mindset of each participant, while the *PALS* survey will identify the goal orientation and instructional tendencies of each participant. The survey I intend to use is located in Appendix F of this document. The survey will be distributed via *Qualtrics Survey System*; a University of Pittsburgh provided electronic survey system.

3.5.2 Survey Sampling

The Western Pennsylvania Superintendent's Forum, founded in 1996 by Dr. Richard Wallace, has provided professional development to a diverse group of superintendents for many years. Current membership encompasses 48 superintendents and 2 intermediate unit directors across 16 counties and 11 intermediate units. As a member of the Forum, I will be requesting permission from my colleagues to survey their building-level administrators. Likewise, I have been given permission to contact the member districts in the Tri-State Area Study Council. There are 66 superintendents in the Tri-State Area Study Council who I will contact to request permission to survey their building administrators. Additionally, I am a member of the Westmoreland County Superintendent's Association. Through this membership, I will be requesting permission from my 16 colleagues to contact their building-level administrators. Due to the number of districts represented in the Forum, the Tri-State Area Study Council, and the Westmoreland County Superintendent's Association, my sample should include more than 200 building-level school

leaders. Unfortunately, the results of this study cannot be generalized beyond Western Pennsylvania region due to the limitations of the sample (Mertens, 2010).

3.5.3 Data Collection

Members of the Western Pennsylvania Superintendent's Forum will receive email invitations requesting permission for their building-level principals to participate in the study (see Appendix G for the invitation letter to superintendents). The letter explains the full scope of the study and the confidentiality of the results and offers to share the results with interested superintendents. Once granted permission by the superintendent, an invitation letter will be sent via email to the building level principals explaining the full scope of the study, the confidentiality of the results and offers to share the results with interested principals (see Appendix H for the invitation email to the building level principals). The survey will be administered using *Qualtrics Survey System.* To ensure participant confidentiality, a Microsoft Excel (Version 2007) document with identifiable principal emails will be uploaded into the *Qualtrics Survey System*. The Excel file housed on the researcher's computer will then be deleted and no record-identifying participants will be retained. The email invitations will be sent from within *Qualtrics Survey System* to each individual principal. Participants will be given four weeks to respond to the survey. Reminder messages will be sent after the first week, after the second week, and again after the third week to those participants who do not complete the survey. Following up with non-respondents is a critical step in ensuring a quality study (Mertens, 2010). Once the four-week window has closed, respondent results will be downloaded for analysis without any identifiable information. The researcher will not be able to identify individual respondents or their districts.

3.5.4 Data Analysis

The data collected in this study will be used to identify trends and patterns among principals using descriptive and inferential statistics. Stata 13 Statistical Software, provided by the University of Pittsburgh, will be used to explore the data collected. Descriptive statistics, such as measures of central tendency (e.g., mean, median), variability (e.g., standard deviation, range), and proportions (for categorical items), will be used to describe characteristics of individual variables in the data (Mertens, 2010). For example, this study will use descriptive statistics to describe the average (mean) years of experience a building-level administrator possesses in relationship to their reported mindset. Additionally, inferential statistics will be used to determine whether sample scores differ significantly from each other or from population values (Mertens, 2010). This study will use inferential statistics for group comparison such as Student's t-Test and Pearson's r Correlation. For example, the study will use a t-test to measure the difference between males and females with respect to their mindsets. Table 2 provides a matrix of research questions, item responses, survey items, and proposed analysis.

Table 2: Data analysis matrix

Research Questions	Item Responses	Survey Item	Analysis
Q1 What theories of intelligence, formal or informal, do principals possess?	Likert scale 1 = Strongly Agree to 6 = Strongly Disagree	1, 3, 5,7	Descriptive approach -includes frequencies and percentages of the distribution of responses Inferential approach -includes t-test to find relationship between my results and the results in prior research

Table 2 (Continued)

Q2 What demographic variables contribute to the differences among principals? 2a. Do principals differ in self-reported, informal or formal, theories of intelligence? i. Building grade levels	Elementary School Middle School Junior High School Junior/Senior High School High School	9	Descriptive approach -includes frequencies and percentages of the distribution of responses Inferential approach -includes t-test to find relationship between 2 independent groups (for example- elementary and rest of group)
Q2 What demographic variables contribute to the differences among principals? 2a. Do principals differ in self-reported, informal or formal, theories of intelligence? ii. Sex	Male Female	10	Descriptive approach -includes frequencies and percentages of the distribution of responses Inferential approach -includes t-test to find relationship between male and female groups
Q2 What demographic variables contribute to the differences among principals? 2a. Do principals differ in self-reported, informal or formal, theories of intelligence? iii. Years of service as an administrator iv. Longevity in current administrative position	Text box for participant to enter an integer representing number of years for iii and iv	11a, 11b	Descriptive approach -includes measures of central tendency, frequencies and percentages of the distribution of responses Inferential approach -include Pearson's Correlation to measures the degree and direction of linear relationship between two variables (for example- relationship between years of service and mindset)
Q2 What demographic variables contribute to the differences among principals? 2a. Do principals differ in self-reported, informal or formal, theories of intelligence? v. Certification area	Math and Science Social Studies and Language Arts Electives & Specialists (Technology Education, Family Consumer Science, Computers and Business Education, Health and Physical Education, Art, Music, Special Education, Library Science, Guidance, etc.	12	Descriptive approach -includes measures of central tendency, frequencies and percentages of the distribution of responses Inferential approach -includes t-test to find relationship between 2 independent groups (for example- Math and Science and rest of group)

Table 2 (Continued)

Q3 What specific practices do principals use to operationalize their self-reported theory of intelligence in their leadership role?	Likert scale 1 = Strongly Disagree to 5 = Strongly Agree	2, 4, 6, 8	Descriptive approach -includes frequencies and percentages of the distribution of responses Inferential approach -include Pearson's Correlation to measure the degree and direction of linear relationship between two variables (for example- relationship between practices and mindset)

In order to answer research question 1, descriptive statistics (mean, standard deviation, median, range, proportions) will be reported for item numbers 1, 3, 5, and 7. Additionally, these items will be combined to form an overall score, ranging from a possible 4 to 24, to assess orientation towards intelligence theory mindsets. Previous research using this scale determined that, typically, 40-45% of participants are entity theorists or possess a fixed mindset, while 40-45% are incremental theorists or possess a growth mindset (Dweck, Chiu & Hong, 1995). Remaining participants fall in between the two mindsets.

To answer research question 2, inferential statistics will utilize demographic data in items 9-12 as independent variables and the total score of self-reported mindset items (items 1, 3, 5, 7) as the dependent variable. For categorical items such as sex and area of certification, Student's *t*-test will allow for discovering significant differences among categories. For example, the mindset scores at each building level will be compared to the scores at other building levels. For continuous data, such as items 11a and 11b, Pearson's *r* Correlations will allow me to measure the degree and direction of a potential linear relationship between the variables (Gravetter & Wallnau, 2010). A positive correlation means that a high year value tends to predict a high mindset score. A negative correlation means that a high year value predicts a low mindset score. *P*-values less than .05 will be considered significant for all inferential tests.

Research question 3 will be both descriptive and inferential. Descriptively, I will assess the practices of the building-level administrators and report descriptive statistics (mean, standard deviation, median, range) for items within item groups 2, 4, 6, & 8. Additionally, specific items within these groups will be combined (See Table 2) to assess particular domains of practice. Descriptive statistics (mean, standard deviation, median, range) will be reported for these four domain scores, and Pearson correlations will be examined to see their relationship to the dependent variable, intelligence theory mindset.

Table 3: Alignment of PALS category and survey items

PALS Category	Item Numbers	Research Tie
Mastery Goal Structure for Students	2b, 2d, 4e, 6a, 6d, 8a, 8d	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim, et al., 2012
Performance Goal Structure for Students	2e, 4a, 4c, 4f, 8b, 8e	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim, et al., 2012
Approaches to Instruction-Mastery	2c, 4b, 4d, 8c	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
Approaches to Instruction-Performance	2a, 2f, 6b, 6c, 6e	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001

Additionally, I will compare my results to the prior research. For example, the review of literature revealed that new teachers favor teacher centered practices due to their focus on the classroom environment and control (Leroy, et al., 2007). Thus, I anticipate that a newer building principal might lean toward more traditional instructional practices or performance-goal orientation. Likewise, the research on goal orientation has proven that even though secondary

level teachers self-report a mastery goal orientation, they choose instructional practices reflective of a performance-goal school culture (Deemer, 2004; Haselhuhn, C.W., Al-Mabuk, R., Gabriele, A.; Groen, M. & Galloway, S., 2007; Midgley, et al., 1995). Also, I plan to compare my results to the results of prior research using the PALS categories I have chosen.

3.6 LIMITATIONS

In general, all studies have limitations due to various reasons such as sampling, methods, or factors out of the researcher's control. This study of principals in Western Pennsylvania has a few predicted limitations. This is a self-reported study, which limits the researcher's ability to interpret the results beyond the close-ended responses given in the survey. A second concern is the limitation introduced by the use of a regional sample. The study cannot be broadly generalized which limits its usefulness by future researchers. Thirdly, it is a descriptive survey, which produces results for a single point in time. Lastly, due to the exploratory nature of the study, some of the analysis may be subjective because there is no foundational data on which to base results or discussion.

4.0 FINDINGS

4.1 INTRODUCTION

The purpose of this study was to gain perspective on the mindsets principals possess and to understand how principals operationalize their beliefs within their building and school culture. The findings of this study will address the gap in the literature by adding foundational knowledge aligning principals' mindsets and their preferred practices in their leadership roles. A sample of building level administrators across Western Pennsylvania participated in the survey. Resulting study findings will answer the following research questions:

1. What theories of intelligence, formal or informal, do building level principals in a regional sample report?
2. What demographic variables contribute to the differences among principals?
3. What specific practices do principals use to operationalize their self-reported theory of intelligence in their leadership roles?

The first section of the chapter will discuss the characteristics of the study sample. The second section will discuss the self-reported theories of intelligence possessed by principals in the regional sample. The third section and following subsections will discuss the nature of demographic differences reported by building level administrators compared to their theories of

intelligence. The fourth section and subsections will address the practices principals choose to operationalize their beliefs in their leadership roles.

4.2 SAMPLE CHARACTERISTICS

Through the Superintendent's Forum of Western Pennsylvania, the Westmoreland Intermediate Unit, and the Tri-State Area Study Council, 112 superintendents were asked for permission to contact their building level administrators. Fifty-five percent (*n*=62) of the superintendents granted access to their principals. Of the 249 building-level leaders that were contacted via email, 59.4% (*n*=148) responded. Participants were contacted over a period of three weeks for the survey window of four weeks. During the first week, 43% (*n*=63) responded. During the second week, 31% (*n*=46) responded and the remaining 26% (*n*=39) responded during the last two weeks of the study. Of the 148 participants who started the survey, six participants did not finish the survey within the survey window and their results were excluded.

4.3 WHAT ARE THE SELF-REPORTED THEORIES OF INTELLIGENCE IN A REGIONAL SAMPLE?

In the data analysis, the first step was to identify the self-reported theories of intelligence the participants possess in the regional sample. Items 1, 3, 5, and 7 of the survey, taken from the *Theories of Intelligence Scale – Others Form* (Dweck, 1999), were used to identify the principals' mindsets. The item responses were from 1 to 6, and median scores ranged from 4

(*mostly disagree*) to 5 (*disagree*). Table 4 depicts the distribution of scores. The composite Dweck score mean or average score was 4.58 (*SD*=1.02) indicating that the survey participant responses fall between *Mostly Disagree* or *Disagree* and Cronbach's alpha demonstrated high internal consistency among items, α=0.92. This finding suggests that the survey participants

Table 4: Frequency and mean score of Dweck items

Item#	Strongly Disagree (6)	Disagree (5)	Mostly Disagree (4)	Mostly Agree (3)	Agree (2)	Strongly Agree (1)	Median Value	Mean	SD
1	38	48	37	14	4	-	5	4.72	1.06
3	34	43	38	17	8	1	5	4.53	1.19
5	37	48	41	9	6	-	5	4.72	1.06
7	26	42	36	25	9	2	4	4.32	1.23

generally lean toward a belief that a child's intelligence is malleable. Participants whose mean Dweck score falls above 4 are self-reporting a growth mindset while participants whose mean score falls below 3 are self-reporting a fixed mindset (Dweck, 1999). Scores between 3 and 4 fall between the two mindsets. In the regional sample, 77% of the principals (*n*=108) reported a growth mindset, 4% reported a fixed mindset (*n*=6) and 19% were in between (*n*=27). The data visually appeared skewed, with most respondents reporting towards the *Disagree* end of the spectrum (See Figure 9).

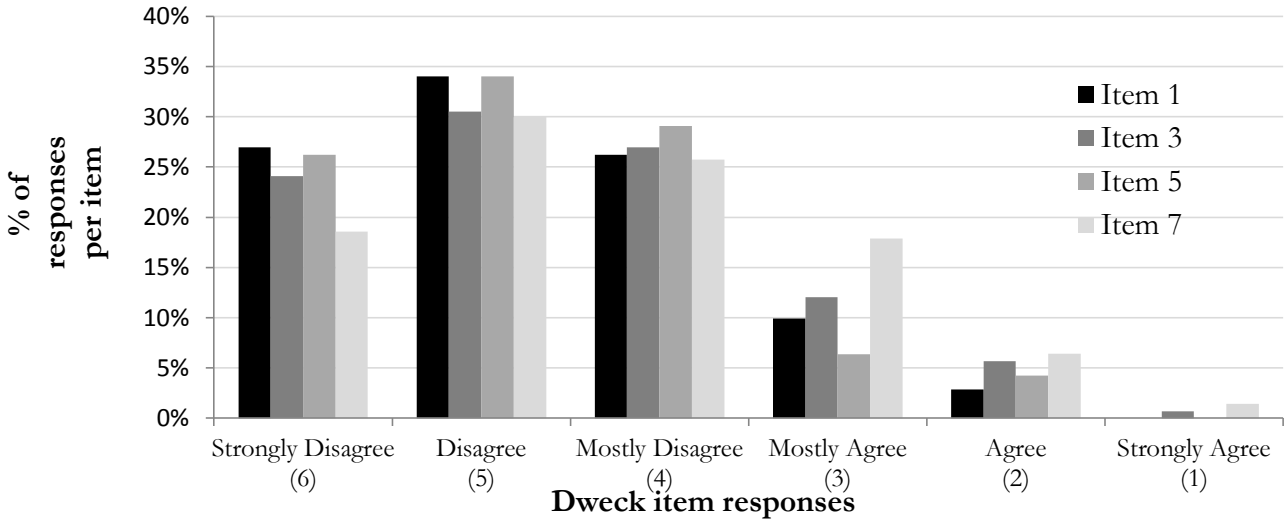

Figure 9: Participant responses to Dweck items

Before proceeding with the originally intended analysis and especially given the apparent skew of the data, normality was assessed using the Shapiro-Wilk test (Gravetter & Wallnau, 2009). Testing assumptions of the Dweck scale composite variable (average score of the four items) revealed a non-normal distribution, Shapiro-Wilk $W(N=140) = 0.97$, $p=0.01$. Therefore, it was not appropriate to utilize parametric test statistics such as a Student t-test or Pearson's Correlation to identify relationships between independent variables and the Dweck score as a dependent variable (Gravetter & Wallnau, 2009). The next section will illustrate how the demographic data contribute to the findings.

4.4 WHAT DEMOGRAPHIC VARIABLES CONTRIBUTE TO THE DIFFERENCES AMONG PRINCIPALS?

After analyzing the overall Dweck scale results, the next analysis focuses on the demographic differences among principals. Five categories were reviewed based on the demographic data provided by study participants: building level, sex, years in administration, longevity in current position and certification areas. Of the 142 participants who responded to the survey, only 6 were found to have a fixed mindset. Their demographic data was unpredictable in every category. For example, the number of years as an administrator

Table 5: Fixed mindset snapshot

Building Level	Sex	Years in administration	Longevity in position	Certification
P Elem	M	9	8	Elem
P Elem	F	25	20	Elem
Elem	F	16	14	Elem-Electives
Elem	M	13	1	Elem
Elem	M	5	2	Elem
Jr/Sr Hi	M	10	9	HS-SS & ELA

ranged from 5 to 25 years. There were four males and two females. Certifications for the fixed mindset participants included four elementary, one elementary elective, and one high school social studies/English language arts. These principals lead buildings from primary to junior high. There were no trends or patterns within the fixed mindset participants.

The data for the growth mindset participants were similar. Of the 142 participants who responded to the survey, 108 were found to have a growth mindset. The number of years in education as an administrator ranged from 1 to 27 years. There were 64 males and 44 females.

Certifications for the growth mindset participants included 43 elementary, 23 electives, 17 math and science, and 25 social studies/English language arts. See Table 6 shows a snapshot of the high school building level data. The high school principals reported a growth mindset.

Table 6: Growth mindset snapshot of high school buildings

Building Level	Sex	Years in administration	Longevity in position	Certification
HS	M	5	2	MS-Math & Science
HS	M	13	9	MS-Electives
HS	M	9	1	MS-Electives
HS	M	17	16	HS-SS & ELA
HS	M	12	5	HS-SS & ELA
HS	M	10	4	HS-SS & ELA
HS	M	6	3	HS-SS & ELA
HS	M	5	1	HS-SS & ELA
HS	M	4	3	HS-SS & ELA
HS	F	22	4	HS-SS & ELA
HS	F	3	3	HS-SS & ELA
HS	M	16	16	HS-math & Science
HS	M	11	4	HS-math & Science
HS	M	9	6	HS-math & Science
HS	F	11	2	HS-math & Science
HS	F	11	3	HS-math & Science
HS	M	24	8	HS-electives
HS	M	21	2	HS-electives
HS	M	15	15	HS-electives
HS	M	15	8	HS-electives
HS	F	14	9	HS-electives
HS	F	10	4	Elem-Electives
HS	M	18	17	Elem
HS	M	14	5	Elem
HS	M	13	12	Elem
HS	F	4	1	Elem

Their certifications ranged from elementary to high school including electives and core content area. Overall, there were no noteworthy trends or patterns in the demographic data.

4.4.1 Self-reported theories of intelligence related to current building level

The first portion of the investigation of demographic data was to ascertain the building levels of the principals. Of the 141 participants who indicated a building level on the survey, 12 reported working in a primary elementary school, 64 in an elementary school, 1 in a junior high school, 22 in a middle school, 12 in a junior-senior high school and 30 in a high school (see Figure 10).

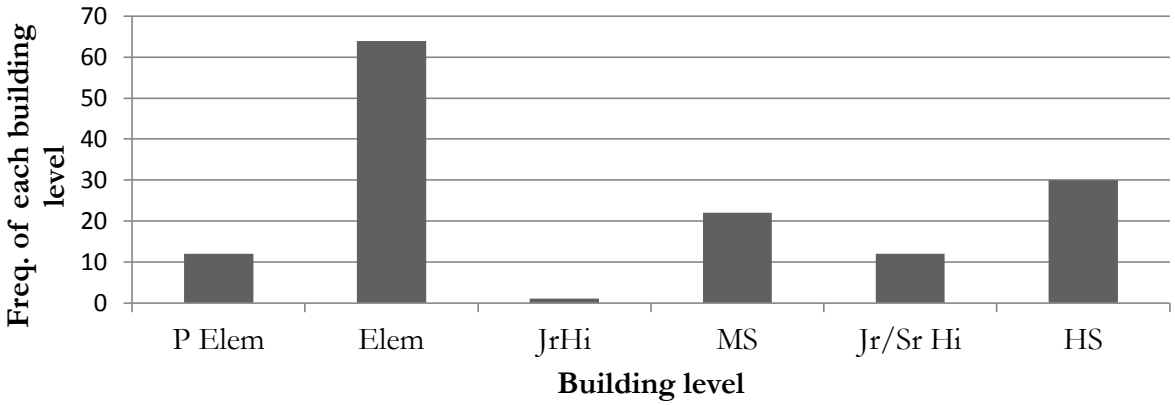

Figure 10: Participants at each building level

In addition, the participants' mindsets were determined using their Dweck mean scores. It was found that 75% of the primary elementary and junior-senior high principals possessed a growth mindset. Similarly, 73% of the elementary principals possessed a growth mindset. One participant in a junior high school reported a growth mindset. The majority of the middle level principals (77%) and the high school principals (87%) indicated a growth mindset (see Table 7).

Table 7: Mindsets of participants by building level

Building Levels	Mindset Categories (*n*)		
	Fixed	Growth	Undetermined
P Elem	2	9	1
Elem	3	47	14
HS	-	26	4
Jr/Sr Hi	1	9	2
Jr. Hi.	-	1	0
MS	-	17	5

Subsequently, average Dweck scores for each building level were determined. Table 6 depicts the calculated mean scores from the *Theories of Intelligence Scale* (Dweck, 1999) at each reported building level. The scores ranged between 4 (*mostly disagree*) and 5 (*disagree*). The findings suggest that there were no differences in the self-reported theories of intelligence

Table 8: Average Dweck scores at each building level

Building Level	% of Responses	Dweck Score
P Elem	8.5	4.79, SD=1.28
Elem	45.4	4.46, SD=1.04
JrHi/MS	16.3	4.84, SD=1.04
Jr/Sr Hi	8.5	4.52, SD=1.33
HS	21.3	4.58, SD=0.70
Total	141	4.58, SD=1.02

Combined Building Levels	Frequency	Dweck Score
Elementary (P Elem, Elem)	76	4.51, SD=1.08
Secondary (Jr Hi, MS, Jr/Sr Hi and HS)	65	4.66, SD=0.96

related to the current building level of the principals in the regional sample. To test the relationship, the Dweck scores of the primary elementary and elementary participants were

grouped together and labeled *Elementary*. Likewise, the junior high, middle school, junior-senior high, and high schools scores were grouped together and entitled *Secondary* (see Table 8). To test the assumption that there is no difference between the two groups, a Mann-Whitney test of rank sums was used to evaluate difference between two separate populations within the sample (Gravetter & Wallnau, 2009).

The original scores were sequentially ordered and a Mann-Whitney test was used to compare the scores of the participants in the two groups (n=65 participants in elementary group, n=76 participants in secondary group). The results, Mann-Whitney z=0.726, p=0.47, indicate no significant difference between the elementary principals and the secondary principals with the total of the scores equal to 4,755 and 5,115 respectively. Thus, there was no significant difference between the self-reported theories of intelligence of the elementary and secondary principal groups.

4.4.2 Self-reported theories of intelligence related to sex

The next analysis seeks to answer the question of whether there was a significant difference between the self-reported theories of intelligence related to the sex of the survey participants. The data was grouped by the categories *Male* and *Female* and the average Dweck scores were calculated. There were 58 female participants in the survey sample and 84 male participants. The average Dweck scores for each group fell around 4 or *mostly disagree* (See Table 9).

Table 9: Average Dweck scores grouped by sex

Sex	Freq.	Percent	Dweck Score
Female	58	40.9	4.59, SD=0.98
Male	84	59.1	4.58, SD=1.05
Total	142	100	4.58, SD=1.02

Additionally, the mindsets of each participant were determined and categorized in the *male* and *female* categories. It was found that 78% of the female participants reported a growth mindset while 3% reported a fixed mindset. Within the male category, 76% of participants reported a growth mindset and 5% reported a fixed mindset (see Table 10). The remaining participant Dweck scores fell between 3 and 4 classifying their mindset as undetermined.

Table 10: Mindsets of participants vs. sex

	Mindsets Categories (*n*)		
Sex	Fixed	Growth	Undetermined
Male	4	64	16
Female	2	45	11

As the Dweck scale data was non-normal, a Mann-Whitney test was used to test the null hypothesis that there was no difference on Dweck score between the two groups. The original scores were sequentially ordered and a Mann-Whitney test was used to compare the scores of the participants of the two groups (n=84 participants in the male group, n=58 participants in the female group). The results indicate no significant difference, Mann-Whitney z=0.083, p=0.93. The sum of the scores was equal to 5,871 and 3,999 for male and female groups respectively. Therefore, no significant difference was detected in the theories of intelligence between males and females in the regional sample.

4.4.3 Self-reported theories of intelligence related to years of service as an administrator and longevity in current position

The next analysis sought to answer the question of whether there was a significant difference between the self-reported theories of intelligence related to the survey participants' years of service as an administrator and their longevity in their current position.

4.4.3.1 Years in administration

Figure 11 portrays the survey participants' frequency of years in administration. The majority of participants have served in administration for 3 to 12 years. In chapter 3, the use of Pearson

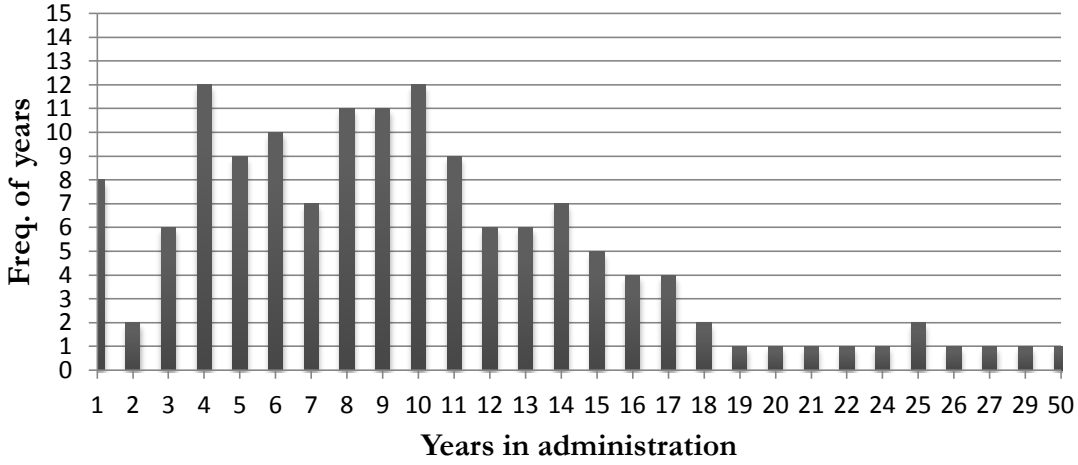

Figure 11: Frequency of years in administration

correlations was discussed. Pearson correlations are best employed to measure linear relationships between two continuous variables (Gravetter & Wallnau, 2009). However, due to the non-normal findings in the Dweck scale scores, a non-parametric measure such as a Spearman correlation is warranted. Spearman correlations are utilized as a more conservative test of "consistency, rather than form" among the Dweck scale variable and other scaled

variables such as years of service in administration and longevity in current position (Gravetter & Wallnau, 2009, p. 540-541). Spearman correlation calculations for years of service in administration produced nearly no trend related to the Dweck scale, Spearman *rho* = 0.02 (*n*=133), *p*>0.05.

Next, the principals' responses were grouped into five ranges: 1 to 5 years of service (*n*=37), 6 to 10 years of service (*n*=51), 11 to 15 years of service (*n*=33), 16 to 20 years of service (*n*=11), and 21 or more years (*n*=9). The average Dweck scores were calculated for each range of years. As with the other demographic data thus far, the average Dweck scores for each group fell around 4 or *mostly disagree*, further demonstrating no difference between Dweck scores related to the principals' years of service in administration (See Table 11).

Table 11: Years in administration

Years in administration	Frequency	Dweck Score
1 to 5	37	4.54, SD=1.01
6 to 10	51	4.60, SD=1.01
11 to 15	33	4.86, SD=0.98
16 to 20	11	3.93, SD=0.98
21 +	9	4.50, SD=1.13

Additionally, the mindsets of each participant were determined and categorized into the same year ranges as above. Of the participants who have served in administration for 5 or less years, 78% reported a growth mindset. Similarly, 73% of the participants ranging from 6 to 10 years reported a growth mindset. The majority of the participants (88%) within 11 to 15 years

Table 12: Mindset of participants vs. years in administration

Years in administration	Mindset Categories (*n*)		
	Fixed	Growth	Undetermined
1 to 5 years	1	29	7
6 to 10 years	2	38	11
11 to 15 years	1	29	3
16 to 20 years	1	7	4
21 + years	1	6	2

of service possessed a growth mindset. In the last two ranges of 16 to 20 years and 21 or more years, 58% and 67% reported a growth mindset, respectively. Table 12 shows the distribution of years in administration and mindsets.

4.4.3.2 Longevity in position

The subsequent analysis centered on a principal's longevity in their current position. The majority of the survey participants have been in their current position for 5 or less years (see Figure 12). There were two participants not represented on the graph who have served for 25 and 50 years, respectively, in their positions.

Figure 12: Longevity in current position

As described in the prior section, Spearman correlations are the best fit for the continued analysis of the Dweck scale data. The Spearman correlations computed for the longevity in current position revealed a *rho* = 0.03 (n=133), p>0.05. No significant relationship existed between survey participants' longevity in their current position and the Dweck scale.

Furthermore, the administrators' responses were grouped into four ranges: 1 to 5 years of service (n=85), 6 to 10 years of service (n=38), 11 to 15 years of service (n=11), and 16 or more years (n=11). The average Dweck scores were calculated for each group. The average Dweck scores for each group fell between 4 (*mostly disagree*) and 5 (*disagree*), thus, providing further evidence of no difference in Dweck scores related to the principals' longevity in their current position as an administrator (See Table 13).

Table 13: Longevity compared to Dweck scale scores

Longevity	Frequency	Dweck score
1 to 5 years	85	4.68, SD=0.98
6 to 10 years	38	4.41, SD=1.03
11 to 15 years	11	4.72, SD=1.19
16 years +	7	4.11, SD=1.14

Next, the mindsets of the individual participants were categorized by longevity in position (see Table 14). Of the 85 participants in the 5 years or less category, 79% reported a growth mindset. In the 6 to 10 years range, 74% of the participants indicated a growth mindset. The majority of the participants (82%) in the 11 to 15 range of longevity years reported a growth mindset. Lastly, 63% of the participants in the 16 or more longevity years conveyed a growth mindset.

Table 14: Mindsets vs. longevity in position

Longevity in position	Mindset Categories (*n*)		
	Fixed	Growth	Undetermined
1 to 5 years	2	67	16
6 to 10 years	2	28	8
11 to 15 years	1	9	1
16 +	1	5	2

The findings related to years in administration and longevity of position have no relationship to the Dweck scale score. The next section will continue the demographic analysis using the certification data.

4.4.4 Self-reported theories of intelligence related to area of certification

The last demographic investigation involved the review of the certifications of the survey participants compared to the Dweck scale scores. Each participant was able to indicate multiple certification categories on the survey. Of the 142 participants who indicated a certification on the survey, 64 reported an elementary certificate. Elective certifications were reported by 29 participants (8 elementary, 3 middle school and 18 high school). Six survey participants reported certification in middle school math and science and 14 in high school math and science. Four participants reported certification in middle school social studies/English language arts and 25 reported certifications in high school social studies/English language arts.

Next, average Dweck scores for each certification category were determined. Table 15 illustrates the certification categories and average Dweck scores. The scores fall between 4

Table 15: Certification categories and Dweck scale scores

Certification Categories	Freq.	Percent	Dweck Score
Elementary			
Electives	8	5.3	4.38, SD=1.09
Elementary Educ.	64	42.7	4.41, SD=1.09
Middle School			
Electives	3	2.0	4.08, SD=1.01
Math & Science	10	6.7	4.92, SD=1.02
SS & ELA	8	5.3	5.37, SD=0.92
High School			
Electives	18	12.0	4.75, SD=0.82
Math & Science	14	9.3	4.62, SD=0.86
SS & ELA	25	16.6	4.80, SD=1.01

(*mostly disagree*) and 5 (*disagree*). The findings suggest that there are no significant differences in the self-reported theories of intelligence related to the certifications of the principals in the regional sample. To test the relationship, the Dweck scores of the middle and high school math and science participants were grouped together and named *Math/Science*. Likewise, the middle and high school social studies and English language arts scores were grouped together and labeled, *Social Studies/English Language Arts*. Dweck mean scores for each group were calculated (see Table 16).

Table 16: Average Dweck scores by certification group

Certification Groups	Frequency	Dweck Score
Math/Science	24	4.71, SD=0.89
Social Studies/English Language Arts	33	4.88, SD=1.00

Next, to test the null hypothesis that there was no difference between the two groups, the original scores were ordered consecutively and a Mann-Whitney test was used to compare the scores for the participants (n=24 participants in *Math/Science* group, n=33 participants in *Social*

Studies/English Language Arts group). The results indicated no significant difference between the groups, Mann-Whitney z=-1.080, p=0.28, with the total of the ranks equal to 630 and 1,023 respectively. Thus, there was no significant difference in the Dweck scale scores between the Math/Science and Social Studies/English Language Arts certification categories.

Next, the individual mindsets of the participants were grouped by certification category. It was found that 65% of the participants with elementary certification and 82% of those with an elementary elective certification reported a growth mindset. At the middle school level, 81% of math and science participants reported a growth mindset. All of the participants at the middle level in the social studies and English language arts certification category possessed a growth mindset. At the middle and high school level, 88% of the participants whose certification

Table 17: Mindset of participants vs. certification

	Mindset Categories (*n*)		
	Fixed	Growth	Undetermined
Elementary			
Elementary	4	40	18
Elem-Electives	1	14	2
Middle School			
MS-SS & ELA	-	11	-
MS-Math & Science	-	13	3
MS-Electives	-	7	1
High School			
HS-SS & ELA	1	22	2
HS-Math & Science	0	12	2
HS-Electives	0	15	2

fell into the elective category indicated a growth mindset. Similarly, 86% of participants with a certification from the math and science category possessed a growth mindset (see Table 17).

The demographic data did not produce any significant statistical findings. None of the areas of building level, sex, years in administration, longevity in position or certification resulted in a trend or pattern when related to the Dweck scale.

4.5 WHAT SPECIFIC PRACTICES DO PRINCIPALS USE TO OPERATIONALIZE THEIR SELF-REPORTED THEORIES OF INTELLIGENCE IN THEIR LEADERSHIP ROLES?

The final research question involves the practices the principals operationalize in their leadership roles and the self-reported theories of intelligence they espouse. Survey items 2, 4, 6, and 8 contained items from the *Patterns of Adaptive Learning Strategies Scale* (Midgley, et al., 2000). The following *PALS* sections were used: *Perceptions of the School Goal Structure for Students: Mastery Goal or Performance Goal* and *Approaches to Instruction: Mastery Approaches or Performance Approaches* scales. The scale, originally given to teachers, measures a teacher's classroom goal structure and approaches to instruction on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). In my study, the survey was used to determine principals' preferred practices related to goal structure and approaches to instruction in their leadership role.

Additionally, in the prescribed statistical analysis, the intention was to use Pearson correlations as a way to measure linear relationships between two continuous variables such as the Dweck scale score and the principal practices. Due to skewedness of the Dweck scale scores, Spearman correlations were utilized to assess any potential relationship among the Dweck scale variable and other scaled variables (e.g., Mastery Goal Structure score, Mastery Approaches to Instruction score, etc.) (Gravetter & Wallnau, 2009).

4.5.1 Performance-Goal Structure

Starting with the Performance-Goal Structure category, scale scores were computed, which included items 2e, 4a, 4c, 4f, 8b, and 8e. Median scores were recorded at 3 (*mostly agree)*. Table 18 illustrates the distribution of scores. The composite PALS Performance-Goal

Table 18: Performance goal item distribution

Item #	Strongly Disagree (1)	Disagree (2)	Mostly Agree (3)	Agree (4)	Strongly Agree (5)	Median Value	Mean	SD
2e	13	48	47	22	9	3	2.76	1.04
4a	14	46	49	30	2	3	2.72	0.96
4c	2	42	58	34	5	3	2.99	0.86
8b	7	57	35	31	10	3	2.86	1.05
8e	14	60	42	21	3	2	2.56	0.94
4f*	14	64	43	16	2	2	2.48	0.88

* This item will be reverse scored.

Structure mean score was 2.90 (*SD*=0.06) and Cronbach's alpha demonstrated high internal consistency among items, α=0.70. The data visually appeared normal (see Figure 13), with most respondents reporting between *Disagree* to *Mostly Agree*. This finding suggests that the survey participants fell into a normal distribution.

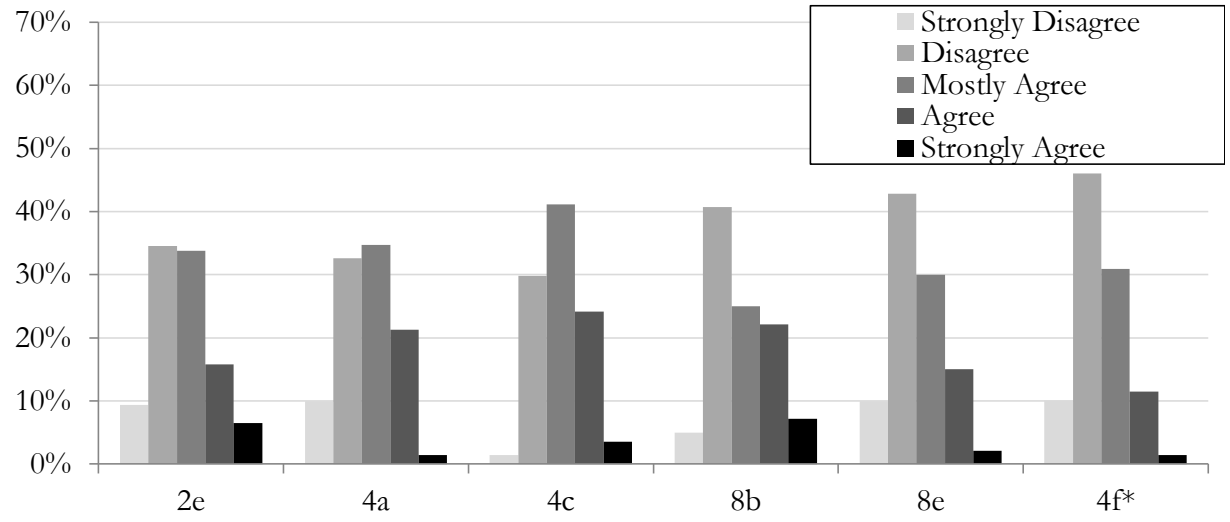

Figure 13: Performance-goal structure of responses

Next, normality was assessed using the Shapiro-Wilk test (Gravetter & Wallnau, 2009). Testing assumptions of the PALS Performance-Goal Structure scale composite variable (average score of the six items) revealed a normal distribution, Shapiro-Wilk $W(N=136) = 0.99$, $p=0.41$.

The next step in the analysis was to measure the relationship between PALS Performance-Goal Structure scale score and the Dweck scale score. Spearman correlation calculations for Performance-Goal Structure produced a slightly negative with minimal correlation to the Dweck scale with a $rho = -0.1290$ ($n=133$), $p>0.05$. Thus, there is no significant relationship between the survey participants' Performance-Goal Structure and the Dweck scale.

Additional analysis was done through the review of the Performance-Goal Structure individual items compared to the breakdown of participants into the categories of Fixed Mindset, Growth Mindset, and Undetermined Mindset. As mentioned at the beginning of chapter 4, 77% of the participants self-reported a growth mindset, 4% self-reported a fixed mindset and the rest fell somewhere in between. In this section, the mean score in each PALS area was calculated within the categories of growth, fixed or undetermined (See Table 19).

Table 19: PALS performance-goal structure scores vs. mindset

Practices	Mindset Categories		
PGS	Growth Mindset	Fixed Mindset	Undetermined
2e	2.6	3.0	2.7
4a	2.7	2.5	2.7
4c	3.0	3.2	3.0
4f*	2.4	2.2	2.7
8b	2.9	2.3	2.8
8e	2.5	2.3	2.4
Overall PGS	2.7	3.1	3.3

Visual inspection of the means across categories and overall means further demonstrates the lack of difference between the mindset groups. Regardless of mindset, participant's responses ranged between 2 (*disagree*) and 3 (*mostly agree*) in reference to endorsing Performance-Goal Structure practices in their leadership role.

4.5.2 Mastery-Goal Structure

Likewise, the Mastery-Goal Structure items - 2b, 2d, 4e, 6a, 6d, 8a, and 8d - were reviewed. Median score values were mostly recorded at 5 *(strongly agree).* Table 20 shows the

Table 20: Mastery-goal structure items distribution

Item #	Strongly Disagree (1)	Disagree (2)	Mostly Agree (3)	Agree (4)	Strongly Agree (5)	Median Value	Mean	SD
2b	-	-	4	26	110	5	4.76	0.49
2d	-	-	4	39	97	5	4.66	0.53
6a	2	5	34	59	41	4	3.94	0.90
6d	1	-	3	43	93	5	4.62	0.61
8a	-	-	5	52	82	5	4.55	0.57
8d	-	-	9	51	80	5	4.51	0.62
4e*	22	60	31	21	7	2	2.51	1.08

*this item will be reverse scored.

distribution of scores. The composite PALS Mastery-Goal Structure score mean or average score was 4.36 (*SD*=0.35) and Cronbach's alpha demonstrated high internal consistency among items, α=0.45. The data visually appeared to lean toward the higher values on each item (see Figure 14), with most respondents reporting between *Agree* and *Strongly Agree*.

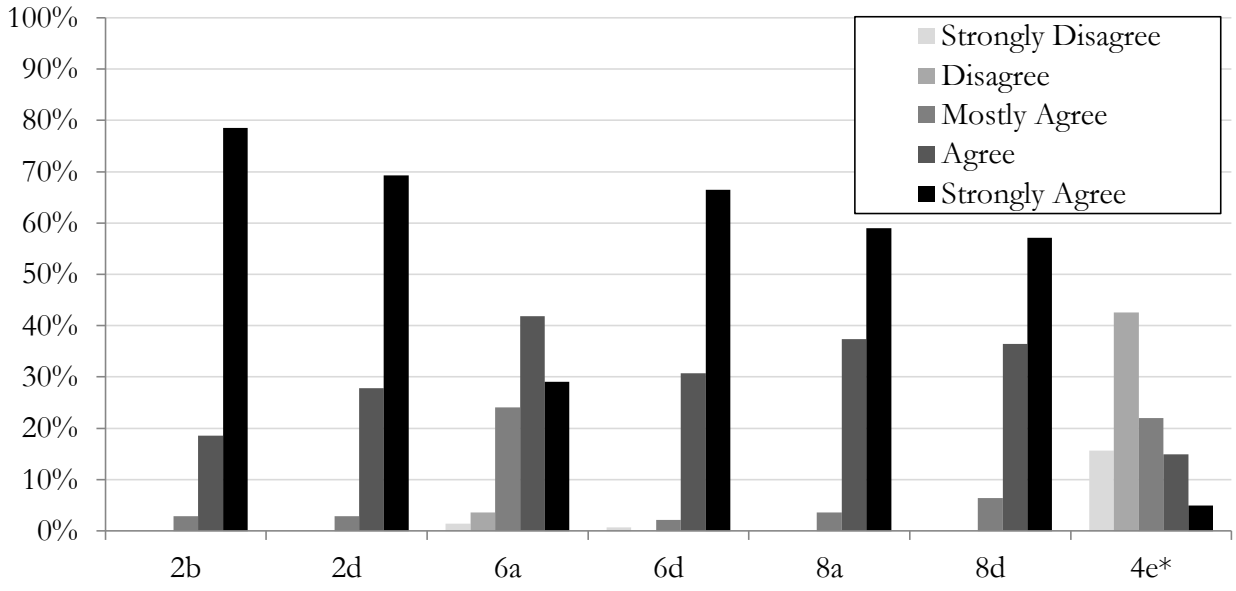

Figure 14: Mastery-goal structure percentage of responses

To test the normality of the data, a Shapiro-Wilk test was utilized. Testing assumptions of the PALS Mastery-Goal Structure scale composite variable (average score of the seven items) revealed a normal distribution, Shapiro-Wilk $W(N=137) = 0.99$, $p=0.22$.

Further analysis measured the relationship between PALS Mastery-Goal Structure scale score and the Dweck scale score. Spearman correlation calculations for Mastery-Goal Structure produced a slightly positive trend to the Dweck scale with a *rho* = 0.0841 ($n=133$), $p>0.05$. Once more, there was no significant relationship between the survey participants' Mastery-Goal Structure and the Dweck scale.

As in the prior review of the Performance-Goal Structure, the Mastery-Goal Structure individual items also were broken down into the categories of Fixed Mindset, Growth Mindset, and Undetermined Mindset. Table 21 depicts the distribution of the PALS Mastery-Goal Structure scores. Visual inspection of the means across categories and overall means further demonstrates the lack of difference between the mindset groups. Regardless of mindset,

Table 21: PALS mastery-goal structure scores vs. mindset

Practices	**Mindset Categories**		
MGS	Growth Mindset	Fixed Mindset	Undetermined Mindset
2b	4.7	4.8	4.7
2d	4.6	5.0	4.7
4e*	3.7	3.8	3.4
6a	4.0	4.0	3.6
6d	4.5	5.0	4.7
8a	4.4	4.7	4.6
8d	4.4	4.7	4.6
Overall MGS	4.3	4.6	4.3

participants' overall responses ranged between 4 (*agree*) and 5 (*strongly agree*) in reference to endorsing Mastery-Goal Structure practices in their leadership roles.

The goal structure analysis comparing PALS results to Dweck mean scores did not reveal any significant statistical relationship. The principals' goal structure preferences are not related to their theories of intelligence.

4.5.3 Performance-Approaches to Instruction

The next phase of the analysis assessed the PALS Approaches to Instruction items from the survey. The Performance-Approaches to Instruction items were numbers - 2a, 2f, 6b, 6c, and 6e. Median scores were reported at 3 *(mostly agree)*. Table 22 shows the distribution of

Table 22: Performance-approaches to instruction item distribution

Item #	Strongly Disagree (1)	Disagree (2)	Mostly Agree (3)	Agree (4)	Strongly Agree (5)	Median Value	Mean	SD
2a	15	59	42	22	2	2	2.55	0.93
2f	7	39	59	27	6	3	2.90	0.92
6b	10	53	41	34	3	3	2.77	0.97
6c	11	58	42	28	2	3	2.66	0.93
6e	2	39	55	38	7	3	3.06	0.90

scores. The composite PALS Performance-Approaches to Instruction mean score was 2.79 (*SD*=0.63) and Cronbach's alpha demonstrated high internal consistency among items, α=0.71. The data visually appeared normal (see Figure 15), with most respondents reporting between

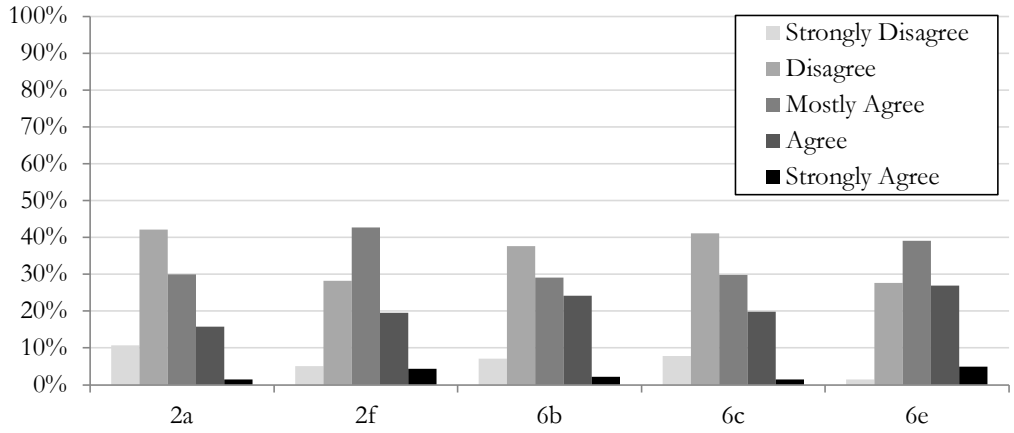

Figure 15: Performance-approaches to instruction percentage of responses

Disagree and *Mostly Agree*. This finding suggests that the survey participants' scores fell into a normal distribution.

Normality was assessed using the Shapiro-Wilk test (Gravetter & Wallnau, 2009). Testing assumptions of the PALS Performance-Approaches to Instruction scale composite variable (average score of the five items) revealed a normal distribution, Shapiro-Wilk $W(N=138) = 0.99$, $p = 0.95$.

Additional analysis reviewed the relationship between PALS Performance-Approaches to Instruction scale score and the Dweck scale score. Spearman correlation calculations for Performance-Approaches to Instruction appeared to have a slightly negative trend when correlated to the Dweck scale with a *rho* = -0.1247 ($n=133$), $p>0.05$. However, there was no significant relationship between the survey participants' Performance-Approaches to Instruction and the Dweck scale.

Further analysis were done by comparing the Performance-Approaches to Instruction individual items to the breakdown of participants into the categories of Fixed Mindset ($n=108$), Growth Mindset ($n=6$), and Undetermined Mindset ($n=27$) (See Table 23).

Table 23: PALS performance-approaches to instruction vs. mindset

Instructional Approaches	Mindset Categories		
AIP	Growth Mindset	Fixed Mindset	Undetermined
2a	2.5	2.5	2.6
2f	2.7	3.0	2.8
6b	2.8	2.7	2.7
6c	2.7	2.7	2.5
6e	3.1	2.8	3.0
Overall AIP	2.8	2.7	2.7

Visual inspection of the means across categories and overall means further demonstrate the lack of difference between the mindset groups. Regardless of mindset, participant's responses ranged between 2 (*disagree*) and 3 (*mostly agree*) in reference to endorsing Performance-Approaches to Instruction practices in their leadership role.

4.5.4 Mastery-Approaches to Instruction

Similarly, the Mastery-Approaches to Instruction items - 2c, 4b, 4d, and 8c - were reviewed. Median scores ranged from 4 to 5 or from *Agree* to *Strongly Agree* (see Table 24). The composite PALS Mastery-Approaches to Instruction average score was 4.39 (*SD*=0.44) and

Table 24: Mastery approaches to instruction item distribution

Item #	Strongly Disagree (1)	Disagree (2)	Mostly Agree (3)	Agree (4)	Strongly Agree (5)	Median Value	Mean	SD
2c	-	2	6	44	89	5	4.56	0.65
4b	-	1	9	64	67	4	4.40	0.64
4d	-	5	22	63	51	4	4.13	0.80
8c	-	-	8	62	70	4.5	4.44	0.60

Cronbach's alpha, α=0.60, demonstrated high internal consistency among items. The data visually appeared to lean toward the higher scores (see Figure 16), with most respondents reporting between *Agree* and *Strongly Agree*.

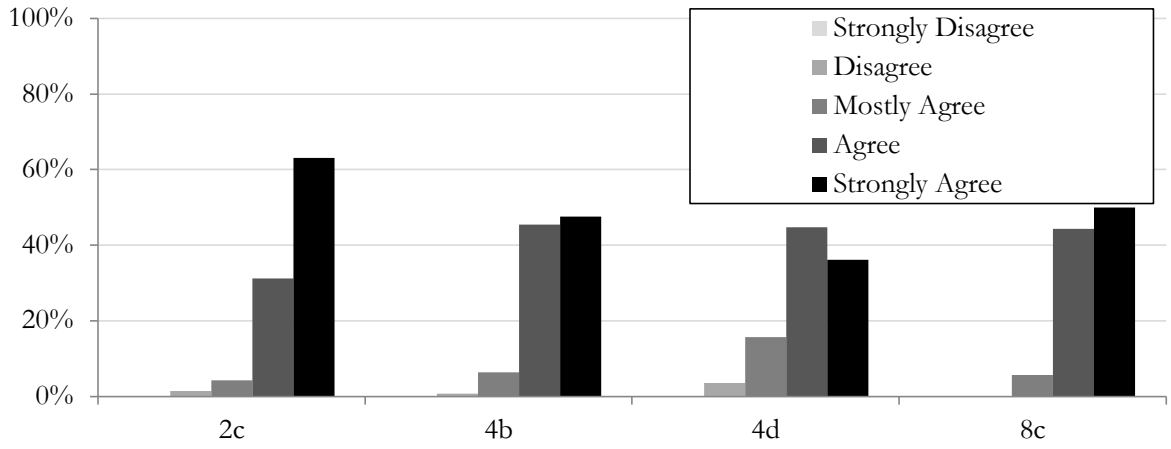

Figure 16: Mastery-approaches to instruction percentage of responses

To test the normality of the data, a Shapiro-Wilk test was utilized. Testing assumptions of the PALS Mastery-Approaches to Instruction scale composite variable (average score of the four items) revealed a normal distribution, Shapiro-Wilk $W(N=140) = 0.99$, $p=.58$.

The following step in the analysis was to measure the relationship between PALS Mastery-Approaches to Instruction scale score and the Dweck scale score. Spearman correlation calculations for Mastery-Approaches to Instruction produced a slightly positive trend to the Dweck scale with a $rho = 0.05$ ($n=133$), $p>0.05$. However, there was no significant relationship between the survey participants' Mastery-Approaches to Instruction and the Dweck scale.

Further investigation of this lack of relationship was done through the review of the PALS Mastery-Approaches to Instruction scores, which were broken down into Growth Mindset, Fixed Mindset and Undetermined Mindset categories based on the participant's mean Dweck score (see Table 25).

Table 25: PALS mastery-approaches to instruction vs. mindset

Instructional Approaches	Mindset Categories		
AIM	Growth Mindset	Fixed Mindset	Undetermined
2c	4.5	4.8	4.7
4b	4.4	4.7	4.5
4d	4.1	3.7	4.4
8c	4.4	4.3	4.5
Overall AIM	4.4	4.4	4.5

The data further demonstrates the similarities in the scores among principals with growth mindsets, fixed mindsets, and those that are undetermined. Regardless of mindset, participant's responses ranged mostly between 4 (*agree)* and 5 (*strongly agree*) in reference to endorsing Mastery-Approaches to Instruction practices in their leadership role.

In summary, the majority of the survey participants reported a growth mindset which skewed the distribution toward the malleable intelligence end of the scale. This finding was not typical of Dweck scale distributions. Further analysis revealed no relationship between the principals' mindsets and demographic variables such as building level, sex, years in administration, longevity in position and area of certification. Likewise, the principals' practices investigation revealed no correlation between preferred goal structure and approaches to instruction and the Dweck scale.

5.0 DISCUSSION AND CONCLUSION

This chapter will highlight the findings of this study, the study's contribution to the education field and implications for further study. Reflecting back to the beginning of this journey, the purpose of the study was to explore principal mindsets and relate them to their preferred instructional environments. Decades of research involving implicit theories of intelligence have led to the development of the growth mindset and the fixed mindset (Dweck, 2006). Furthermore, Dweck identified effective educators as people who believe in the growth mindset of intellect and are fascinated with the process of learning. Effective educators, she reports, also, provide high standards, a nurturing atmosphere, and promote hard work, effort, persistence, and resiliency in learning (Dweck, 2006). Seeking to describe the environment of the growth mindset educator, I turned to the Principles of Learning, which assert that through effort and hard work, a child can grow her ability (Resnick, 2001). Dr. Resnick redefines intelligence as more than an innate ability. Intelligence becomes a social construct that grows with experiences, exposure, and effort. These constructs are representative of the work of teachers, parents, and coaches and are representative of educators across various roles in a school setting. My research applied these concepts to school level leadership within the Wallace Foundation's key roles of the principal shaping a vision of academic success for all students, creating a climate that is hospitable to learning, and improving instruction (Wallace Foundation, 2013).

5.1 SELF-REPORTED IMPLICIT THEORIES OF INTELLIGENCE

The Wallace Foundation literature states that the first key role of an effective principal is to shape a vision of academic success for all students. This construct aligns with the effective educator characteristic identified as the growth mindset, which implies that genuine effort grows ability (Dweck, 2006; Resnick, 1999). My exploratory research was geared toward discovering the self-reported theories of intelligence of building-level administrators in the regional sample. Up to this point, no one in the research literature has used the *Theories of Intelligence Scale* (Dweck, 1999) to measure the mindset of building level educators. Prior research consistently found that 40-50% of study participants have a fixed mindset while the other 40-50% possess a growth mindset (Dweck, et al., 1995; Levy, et al., 1998; Dweck, 1999). Any remaining participants fell somewhere in between. In this study, 77% of the participants endorsed a growth mindset while only 4% reported a fixed mindset. The remaining 19% fell into the indeterminate range. This finding was both concerning and exciting. Initially, the concern is that the principals answered in a socially desirable manner to avoid appearing harsh or calloused in the study. Fortunately, prior research has considered this phenomenon and demonstrated no relationship between espoused implicit theories and responding in a socially desirable manner (Dweck, et al., 1995; Levy, et al., 1998). Additionally, the study used the four-entity item version of the *Theories of Intelligence* scale, which eliminates the incremental items that school administrators may be likely to lean toward if responding in a socially desirable manner (Dweck, et al., 1995; Levy et al., 1998). Therefore, I have dismissed the notion that the data are skewed due to the participants' desire to be socially acceptable.

The fact that the majority of the principals in the sample reported a growth mindset is exciting for a couple reasons. One, growth mindset educators are predicted to possess the

characteristics within the framework of the effective educator as defined by Dweck (2006). Additionally, these characteristics align to the *Socializing Intelligence* environment described within the *Principles of Learning* framework (Resnick, 2001). These types of instructional environments lead to greater student achievement (Resnick, 2001). Thus, the best educational leaders would share these characteristics and possess a growth mindset.

Similarly, the findings are noteworthy because educators who are confident in their capacity to improve student achievement are more likely to believe in a growth mindset (Deemer, 2004). For instance, if higher achievement and student growth are the goals of schools, the educators must believe that they can accomplish the task. High levels of self-efficacy are essential to believing the desired outcome can be obtained (Ahmad, 2011). In order to generate the characteristics of a socializing intelligence environment effectively, school leaders should possess a growth mindset, which points to high self-efficacy and ultimately higher expectations for students (Rubie-Davis, 2010). When questioning such a high percentage of growth mindset results, it is conceivable to think that teachers who choose to make the journey out of the classroom into the principal's office are typically educators who possess high self-efficacy and believe children have unlimited potential. Therefore, it makes sense that 3 out of every 4 principals in the survey sample report a growth mindset and are in positions that allow them to have a greater impact in the lives of students.

Shaping a vision for academic success for all students is one of the most important roles of the principal. Possessing a growth mindset is a crucial characteristic in ensuring that opportunities are given to all students. The principal's mindset carries over into the culture she establishes for her school. The environment an organization establishes promotes a certain culture that will be reflective of the leader's implicit theory of intelligence (Murphy & Dweck,

2009). This leads the discussion to participant demographics, which are discussed in the following sections.

5.2 DEMOGRAPHIC ROLE IN THE SELF-REPORTED THEORIES OF INTELLIGENCE

This section discusses the demographic findings reported in the study and how the findings relate to the principals' self-reported theories of intelligence. The research was geared to years in administration, longevity in current position, sex, building level, and certification areas.

As shared in Chapter 4, the statistical analysis between the building level and the Dweck scale results revealed no significant differences. Additionally, there were no trends or patterns found between the building level a principal holds and her mindset. Interestingly, in the small group of fixed mindset principals, there were more elementary-level principals than secondary. These results are in contrast to the previous findings in the literature. Recall that goal orientation is driven by a person's implicit theory of intelligence (Dweck, 2006). For instance, a person who endorses a performance goal orientation would most likely possess an entity theory of intelligence (Dweck, 2006). Furthermore, secondary educators tend to favor performance goals rather than learning goals, while elementary educators tend to lean more toward learning goals (Midgley, et al., 1995). Thus, secondary administrators would more likely report a fixed mindset; yet, the findings in this study are contrary to this assumption. The secondary principals did not report a fixed mindset. In fact, the secondary principals reported a growth mindset more often than their elementary peers did. Perhaps this finding is related to the recent changes in standards at the state level and the required level of engagement the new standards demand. For

example, the Pennsylvania Standards of Mathematical Practice within the Pennsylvania Common Core Standards require students to construct viable arguments and analyze the reasoning of others. At the secondary level, students who may typically explain their answers on an exam are now required to be able to evaluate their own responses and respond to the arguments of their peers. Through student discourse in the classroom, the students learn from others' thinking and must defend their own with mathematical theory. The types of reasoning and discussion required in the Standards of Mathematical Practice are much different from the traditional mathematics classroom environment. Therefore, it is probable to think that the new standards and required practices have challenged administrators to promote more mastery-oriented practices than in the past.

The next demographic area focuses on content or certification area. Again, there was no relationship between differences in the content principals taught prior to their role as an administrator and their theories of intelligence. In the review of literature, math and science educators who chose to teach their content as factual with an emphasis on arriving at the single answer tend to lean toward a fixed mindset (Mansour, 2009; Stipek, et al., 2001). Likewise, educators who teach math and science using inquiry based methods lean toward a growth mindset (Mansour, 2009; Stipek, et al., 2001). The expectation, in this study, would be that more math and science educators might fall into the undetermined and fixed mindset group. However, the majority of the math and science teachers fall into the growth mindset category. The potential reason for this might be related to the fact that growth mindset teachers are truly the ones that leave the classroom to become administrators. Therefore, if educator populations are similar to others using the same scale, it may be plausible to think that those still in the classroom are more likely to possess an undetermined or fixed mindset. Learning the mindsets

of math and science teachers still in the classroom might clarify this anomaly and help to explain why.

The other three demographic areas of sex, years in administration and longevity in current position also showed no trends or patterns. These areas are unexplored in the literature related to theories of intelligence. My anticipation with the participant sex data was that females would report a growth mindset more often than males due to the nature of female maternal behaviors. The study findings of principals in the regional sample contradicted my assumption, revealing no significant differences between male and female principals. Next, the demographic areas of years in administration and longevity in position were also insignificant. I assumed that new administrators would be more management focused and less instructionally focused leading to more of a fixed mindset in their early years as an administrator. The data did not support my assumption. Once more, there was no significance difference or any kind of trend related to longevity in position and the Dweck scale score.

The demographic items were not as helpful as originally anticipated. The lack of significance of each area when compared to the Dweck score was also unexpected. The next section will discuss the principal practices espoused to improve instruction and establish a climate that is hospitable to learning.

5.3 PRINCIPAL PRACTICES AND THEORIES OF INTELLIGENCE

The portion of the study focused on two specific areas of practice – goal structure and approaches to instruction. The Patterns of Adaptive Learning Strategies measure was utilized to assess preferred goal structure and approaches to instruction. Prior studies conducted using the

same scale focused on teachers and their classroom goals and instructional approaches. The mean scores in each area of this study align with the previous mean scores using the same scales (see Appendix D). Additionally, these areas of practice relate to the principal's key role of improving practice and creating an environment that is hospitable to learning (Wallace Foundation, 2013).

Prior research found a strong relationship between an educator's goal orientation and the type of goal structure used in the classroom; however, there was no statistical support relating the teacher's implicit theory of student ability (Shim, et al., 2012). Likewise, there were no significant findings in this study between the goal structure mean scores and the Dweck scale items. For example, a comparison of the Performance-Goal Structure and Mastery-Goal Structure items broken down by principal mindset indicated no differences across mindsets. However, it was obvious that all the principals in the survey espoused Mastery-Goal Structure over Performance-Goal Structure. Prior research using these scales found that elementary teachers endorsed a Mastery-Goal Structure while secondary teachers tended to lean toward a Performance-Goal Structure (Haselhuhn, et al., 2007; Midgley, et al., 1995). These findings are inconsistent with the study results in the regional sample of principals. Additionally, these scales have never been used to describe the preferred practices of principals. Similarly, they have never been correlated to the Dweck scale. Perhaps, the principals' preference of mastery-goal structure could be explained through the lens of the increased pressures of the current educational landscape.

In addition to the Goal Structure Scale, the study included the *Patterns of Adaptive Learning Strategies: Approaches to Instruction Scales* (Midgley, et al., 2000). My findings are comparable to both *Approaches to Instruction* scales (see Appendix D); however, the attempt to

identify a significant relationship between the self-reported theories of intelligence principals possess and their preferred approaches to instruction was unsubstantiated. When the Performance-Approaches to Instruction and Mastery-Approaches to Instruction items were broken down by principal mindset, it was evident that principals embraced Mastery-Approaches to Instruction over Performance-Approaches to Instruction.

Educators who believe in their ability to improve student achievement also tend to choose instruction practices that promote student autonomy and build persistence and resiliency in students (Leroy, et al., 2007). In the same way, educators with an incremental theory of intelligence are likely to promote constructivist approaches to instruction (Mansour, 2009; Schraw & Olafson, 2002; Rubie-Davis, 2010). The principals in this study leaned toward constructivist approaches to instruction, which align with the Principles of Learning and promote high expectations and student autonomy. These constructivist instructional practices lead to higher achievement and a belief in a malleable intelligence (see Figure 7). Even those who reported a fixed mindset chose approaches to instructional practices that promote the concept of socializing intelligence and the characteristics of an effective educator (Dweck, 2006; Resnick, 2000). These choices of practice are an important part of the principals' key roles to ensure that they are creating an environment that is conducive to learning and one that makes improving instruction a priority.

The findings indicate the majority of principals possess a growth mindset and they favor mastery-goal orientation items. One possible explanation for this unpredicted outcome is the pressure of the multiple changes at the Pennsylvania Department of Education. When the *PALS* scale (Midgley, 2000) and the *Theories of Intelligence* scale (Dweck, 1999) were developed, Pennsylvania had specific benchmark standards for achievement. Student achievement was

measured each year on the Pennsylvania System of School Assessment (PSSA) exam. At that time, the content being taught was changing, but the methods used to teach the content were not. More recently, Pennsylvania adopted the Pennsylvania Common Core standards which, significantly adjusts how and when teachers teach concepts. Furthermore, the PSSA is now being used to measure the individual growth of students. These new standards require depth of thinking alongside depth of content. They force educators to rethink how they teach more so than what they teach. These changes have required districts to immerse themselves in best practices such as the Principles of Learning (Resnick, 2001) and Habits of Mind (Costa & Kallick, 2000). These practices include real-world problem solving, the integration of critical thinking, and active use of knowledge to develop new ideas and make connections. They include teaching students to take ownership of mistakes as part of learning and improving, to be responsible for their own learning, and to understand that learning takes effort, persistence, and resiliency. Furthermore, the new standards are coupled with new measures of effectiveness for schools, teachers, and principals. These new accountability measures have introduced a great deal of pressure and stress on the adults in the education system.

Interestingly, every principal in this study espoused the items describing mastery-goal structure and mastery-approaches to instruction. When teachers view their principal as mastery-goal oriented, the principal creates an environment that plays an important role in the improvement of teacher work and, in turn, increases student achievement (Bruggencate, et al., 2012). Since, mastery-oriented strategies are now required to accomplish the task of improving academic outcomes for individual students; growth mindset principals would be the ideal administrators for the school setting. Under the leadership of a growth mindset principal, academic rigor in a thinking curriculum, learning as apprenticeship, accountable talk, self-

management of learning and clear expectations remain prevalent and the environment is conducive to learning and focuses on improving instruction (Resnick, 2001). In addition, the environment is focused on learning goals rather than performance. There is a shared responsibility and accountability for the quality of learning that exists between the adults and the students in the school. Students take ownership of their learning and are actively engaged in their progress (Resnick, 2001). Unfortunately, the new pressures of adult accountability are forcing educators in the system to find a balance between demonstrating higher student growth and achievement and providing an environment where students are active participants in their learning. It would be interesting to learn whether the practices the principals endorse are the ones they actually implement in their schools.

5.4 LIMITATIONS

This study of principals in Western Pennsylvania included both predicted and unexpected limitations. Self-reported surveys limit the researcher's ability to interpret the results beyond the close-ended responses given in the survey. In addition, a self-reported survey can elicit responses that are ideal in the person's mind rather than what they truly believe as an individual. Without a follow-up interview or observation, there is no way to determine if the results illustrate the participants' perception or reality. Another concern associated with this study is the current educational landscape. It is plausible that due to the pressure on districts to change, principals are leaning toward these proven best practices to raise achievement in a time when they have no other choice. Furthermore, although the response rate (59%) was adequate, the study cannot be broadly generalized beyond western Pennsylvania, which limits its usefulness, by future

researchers. Likewise, the study was descriptive obtaining results for a single point in time, which again limits its usefulness by future researchers. Lastly, due to the exploratory nature of the study, some of the analysis may be subjective because there is little foundational data on which to base results or discussion. The results are a small representation of the vast information waiting to be discovered in this area.

5.5 IMPLICATION FOR RESEARCH AND PRACTICE

Throughout the literature, an incremental theory of intelligence has been identified as the best mindset for educators and students. Believing that intelligence can increase with effort, hard work and persistence is a significant component of a socializing intelligence school environment. This construct has several implications for practice.

When administrators have a growth mindset, the practices that promote high student achievement would be promoted as part of the school culture not simply as a necessary job task due to changes in standards or pressures from high stakes testing. The study results show that all administrators are aware of what practices lead to high student engagement and achievement. Instilling this knowledge at the teacher level is paramount.

Another implication for practice is related to the professional development activities that are provided for teachers. Prior to the study, my focus was educating my principals about their mindsets. At this point, although I am curious about teacher mindsets, I wonder if it is more beneficial to train teachers to help students understand their own mindsets, and to help students change their mindsets, if necessary. Multiple studies have shown growth in student achievement when students were made aware of mindsets or were taught to change their mindset. Indirectly,

teachers would also become aware of their own mindsets and how their mindset aligns to the practices, they are required to endorse. Moreover, it would be beneficial for administrators who prepare professional development activities to understand the impact of mindsets, so that they may deliver instruction that would build self-efficacy and a malleable intelligence among staff.

Along with the recommendations for practice, there are a few implications for future research. To avoid questioning whether participants were leaning toward socially acceptable responses, a few lie scale items could be added to monitor the truthfulness of participants and strengthen the study. It may also be beneficial to conduct a study that examines the relationship between principal mindset, instructional practices of teachers, and the culture of the school by collecting data using structured interviews, observations, and analysis of professional development plans. Additionally, it would be interesting to know whether the principal's staff actually reflects what she reports and, if not, how were their perceptions of their school culture different. As unexpected as it was to find that the majority of principals in the sample have a growth mindset, it would have been interesting to compare the participants' responses to their teachers' responses. Likewise, it would have been interesting to learn the teachers' mindsets and compare them to the principal's perception of his staff. In addition, one of the most effective ways to further this exploratory study would be to add an observation piece that would explore the differences between a principal's theory and her actual practices within the school.

5.6 CONCLUSION

In conclusion, building-level leaders establish a school's culture through their actions and behaviors (Sahin, 2011). The way principals operationalize their vision of academic success for

all students, as well as, how they create a climate that is hospitable to learning and how they strive to improve instruction, are essential elements to their success as an administrator (Wallace Foundation, 2013). As school leaders, growth-mindset principals lay a foundation of malleable intelligence and promote instructional strategies that engage students in learning habits that increase their intelligence and their self-efficacy (See Figure 17). In this study, three out of

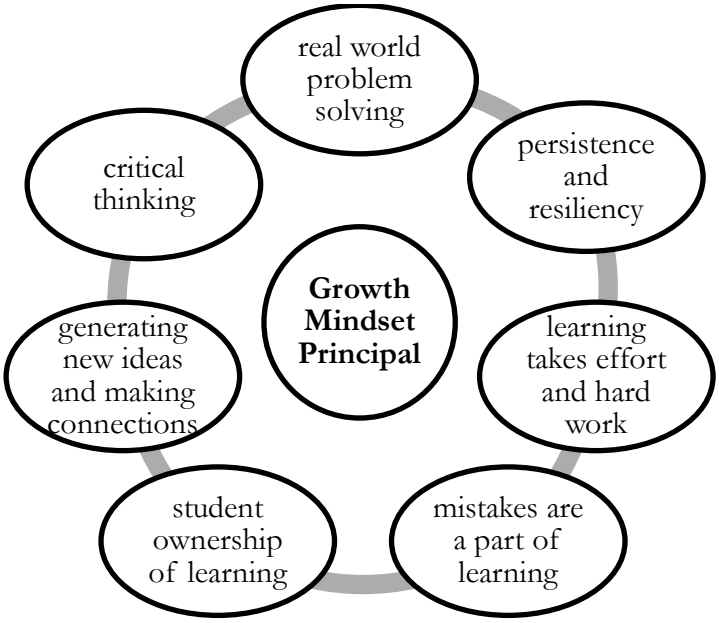

Figure 17: Practices growth mindset principals endorse

every four building-level leaders self-reported a growth mindset. These principals endorsed the practices above that align with the Socializing Intelligence Framework (Resnick, 2001) and the characteristics of an effective educator (Dweck, 2006). These approaches to instruction promote critical thinking, the generation of new ideas and making connections and real world problem solving. They challenge students to realize that learning takes effort and hard work, mistakes are a part of the learning process, persistence and resiliency are important, and that owning the learning process is essential. Even the principals who self-reported a fixed mindset or an

undetermined mindset espoused these practices. Regardless of their mindset, the principals agree that these mastery-oriented practices promote the cognitive processes and efficacy in students that are required to connect learning to the world around us and, ultimately, lead to graduates who are prepared for work, college, and citizenship.

APPENDIX A

PERMISSION: THEORIES OF INTELLIGENCE SCALE

Shannon Wagner

From: Maureen Sullivan <maureen.sullivan@stanford.edu>
Sent: Thursday, February 27, 2014 6:37 PM
To: Shannon Wagner
Subject: Re: Requesting use of Dr. Dweck's Survey per our telephone conversation

Dear Shannon,

Please consider this email permission to use the intelligence scale for your doctoral studies research design. Best wishes to you, Shannon.

Maureen Sullivan
Stanford University
[redacted]

On Feb 27, 2014, at 3:33 PM, Shannon Wagner [redacted] wrote:

Ms. Maureen Sullivan
Administrative Associate to Dr. Carol Dweck
Department of Psychology
University of Stanford

Dear Ms. Sullivan,

I am emailing you to request written verification that I may use Dr. Dweck's *Theories of Intelligence Scale-Others Form for Adults* (Dweck, p. 178, 1999) as part of my research design for my doctoral studies at the University of Pittsburgh. This is a follow up to the telephone conversation we had on February 27, 2014 at @5:20pm Eastern Time.

The University of Pittsburgh IRB process requires written permission. Please provide confirmation of Dr. Dweck's permission by responding to this email.

I greatly appreciate your assistance!

Shannon

Shannon L. Wagner
[redacted]

**"If you treat an individual as he is, he will remain how he is.
But if you treat him as if he were what he ought to be and could be,
he will become what he ought to be and could be."**
— Johann Wolfgang von Goethe

Figure 18: Permission to use Dweck-Theories of Intelligence Scale

APPENDIX B

THEORIES OF INTELLIGENCE SCALE
ENTITY ONLY ITEMS (DWECK, 1999)

To what extent do you agree or disagree with this statement:

1. Children have a certain amount of intelligence, and they can't really do much to change it.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

2. A child's intelligence is something about them that they can't change very much.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

3. To be honest, children can't really change how intelligent they are.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

4. Children can learn new things, but can't really change their basic intelligence.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

APPENDIX C

PERMISSION: PATTERNS OF ADAPTIVE LEARNING STRATEGIES SURVEY

License Agreement #4430-umich

This license agreement is ***completed***.

Pricing Information

Unit Price	Quantity	Net Price	Sales Tax	Shipping	Total Price
$0.00	1	$0.00	$0.00	$0.00	$0.00

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First Name	Last Name	Email Address	Organization	
Shannon	Wagner	slw38@pitt.edu	University of Pittsburgh	
Title		**Phone Number**	**Address**	
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APPENDIX D

Table 26: PALS Scale Summaries (Midgley, et al., 2000)

Perceptions of the School Goal Structure for Students		
Performance Goal Structure for Students: Descriptive Statistics		
Items	**Mean**	**Standard Deviation**
2e	2.67	0.98
4a	3.07	1.08
4c	3.28	0.93
4f	3.39	0.96
8b	3.36	1.28
8e	2.44	0.96
Skewness -0.17; Alpha .70	Scale Mean 3.02	Scale SD 0.67
Mastery Goal Structure for Students: Descriptive Statistics		
Items	**Mean**	**Standard Deviation**
2b	4.44	0.72
2d	4.28	0.80
4e	3.66	0.91
6a	3.73	0.96
6d	4.20	0.78
8a	4.33	0.76
8d	3.86	0.88
Skewness -0.33; Alpha .81	Scale Mean 2.07	Scale SD 0.56
Approaches to Instruction		
Performance Approaches: Descriptive Statistics		
Items	**Mean**	**Standard Deviation**
2a	2.15	1.34
2f	2.19	1.30
6b	2.49	1.35
6c	1.79	0.93
6e	2.42	1.38
Skewness 0.32; Alpha .69	Scale Mean 2.21	Scale SD 0.85
Mastery Approaches: Descriptive Statistics		
Items	**Mean**	**Standard Deviation**

Table 26 (Continued)

2c	4.31	0.93
4b	2.41	1.12
4d	3.75	1.11
8c	3.22	1.17
Skewness -0.16; Alpha .69	Scale Mean 3.44	Scale SD 0.76

APPENDIX E

Table 27: Modification of PALS

PALS #	PALS wording	Adapted wording	Item #	PALS Sect.	Concept Research Tie
1	In my classroom: I give special privileges to students who do the best work.	Give special privileges to students who do the best work.	2a	PIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
3	In this school: The importance of trying hard is really stressed to students.	Stress to the students the importance of trying hard.	2b	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
4	In my classroom: I make a special effort to recognize students' individual progress, even if they are below grade level.	Make a special effort to recognize students' individual progress, even if they are below grade level.	2c	MIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001

Table 27 (Continued)

5	In this school: Students are told that making mistakes is OK as long as they are learning and improving.	Tell students that making mistakes is OK as long as they are learning and improving.	2d	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
7	In this school: It's easy to tell which students get the highest grades and which students get the lowest grades.	Can easily tell which students get the highest grades and which students get the lowest grades.	2e	PSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
9	In my classroom: I display the work of the highest achieving students as an example.	Display the work of the highest achieving students as an example.	2f	PIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
10	In this school: Students who get good grades are pointed out as an example to other.	Point out students who get good grades as an example to others.	4a	PSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
11	In my classroom: During class, I often provide several different activities so that students can choose among them.	Often provide several different instructional activities so that students can choose among them.	4b	MIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001

Table 27 (Continued)

12	In this school: Students hear a lot about the importance of getting high-test scores.	Often tell students about the importance of getting high-test scores.	4c	PSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
13	In my classroom: I consider how much students have improved when I give them report card grades.	Consider how much students have improved, when we issue report card grades.	4d	MIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
14	In this school: A lot of the work students do is boring and repetitious (reversed)	A lot of the work students do is boring and repetitious (reversed)	4e	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
15	In this school: Grades and test scores are not talked about a lot (reversed)	Do not talk about grades and test scores a lot (reversed).	4f	PSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
16	In this school: Students are frequently told that learning should be fun.	Tell students that learning should be fun frequently.	6a	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
17	In my classroom: I help students understand how their performance compares to others.	Help students understand how their performance compares to others.	6b	PIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001

Table 27 (Continued)

19	In my classroom: I encourage students to compete with each other.	Encourage students to compete with each other.	6c	PIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
20	In this school: The emphasis is on really understanding schoolwork, not just memorizing it.	The emphasis is on really understanding schoolwork, not just memorizing it.	6d	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
21	In my classroom: I point out those students who do well as a model for the other students.	Point out those students who do well as a model for the other students.	6e	PIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
22	In this school: A real effort is made to recognize students for effort and improvement.	Make a real effort to recognize students for effort and improvement.	8a	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
25	In this school: Students hear a lot about the importance of making the honor roll or being recognized at honor assemblies.	Often tell students about the importance of making the honor roll or being recognized at honor assemblies.	8b	PSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012

Table 27 (Continued)

26	In my classroom: I give a wide range of assignments, matched to students' needs and skill level.	Give a wide range of assignments, matched to students' needs and skill level.	8c	MIA	Dweck, 2006; Deemer, 2010; Grant & Dweck, 2003; Kuntze, 2011; Leroy et al., 2007; Mansour, 2009; Rattan et al., 2012; Resnick, 1999; Resnick, 2001; Resnick & Hall, 1997; Sous & Gray, 2012; Speer, 2008; Stipek et al., 2001
27	In this school: A real effort is made to show students how the work they do in school is related to their lives outside of school.	Make a real effort to show students how the work they do in school is related to their lives outside of school.	8d	MSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012
29	In this school: Students are encouraged to compete with each other academically.	Encourage students to compete with each other academically.	8e	PSG	Blackwell et al, 2007; Deemer, 2010; Dweck & Legget, 1988; Mueller & Dweck, 1998; Shim et al., 2012

*PIA = Performance Instructional Approaches; MIA = Mastery Instructional Approaches; PSG = Performance School Goal; MSG = Mastery School Goal
(Midgley et al., 2000)

APPENDIX F

PRINCIPAL PRACTICES SURVEY

My study will investigate building level administrators' theories of intelligence and the practices they endorse in their leadership roles.

There are no right or wrong answers. I am interested in your ideas and practices. The survey will take approximately 10 minutes. Your participation is completely voluntary. Your answers are not linked to you, your email, your school or school district.

As you read the questions, "we" refers to you and your faculty.

Your participation is important to the success of the study. Thank you for your time and responses.

Q1. To what extent do you agree or disagree with this statement: (reverse score)

> Children have a certain amount of intelligence, and they can't really do much to change it.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

Q2. Read each statement below. Select the answer which best represents the practices of the professional staff in your school.

Question	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
a. Give special privileges to students who do the best work.					
b. Stress to the student the importance of trying hard.					
c. Make a special effort to recognize student individual progress, even if they are below grade level.					
d. Tell students that making mistakes is OK as long as they are learning and					

improving.					
e. Can easily tell which students get the highest grades and which students get the lowest grades					
f. Display the work of the highest achieving students as an example					

Q3. To what extent do you agree or disagree with this statement: (reverse score)

A child's intelligence is something about them that they can't change very much.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

Q4. Read each statement below. Select the answer which best represents the practices of the professional staff in your school.

Question	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
a. Point out students who get good grades as an example to others.					
b. Often provide several different instructional activities so that students can choose among them.					
c. Often tell students about the importance of getting high test grades.					
d. Consider how much students have improved, when we issue report card grades.					
e. A lot of work students do is boring and repetitious. (reverse score)					
f. Do not talk about grades and test scores a lot. (reverse score)					

Q5. To what extent do you agree or disagree with this statement. (reverse score)

To be honest, children can't really change how intelligent they are.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

Q6. Read each statement below. Select the answer which best represents the practices of the professional staff in your school.

Question	Strongly	Disagree	Somewhat	Agree	Strongly

	Disagree		Agree		Agree
a. Tell students that learning should be fun frequently.					
b. Help students understand how their performance compares to others.					
c. Encourage students to compete with each other.					
d. The emphasis is on really understanding schoolwork, not just memorizing it.					
e. Point out those students who do well as a model for the other students.					

Q7. To what extent do you agree or disagree with this statement: (reverse score)

Children can learn new things, but can't really change their basic intelligence.

Strongly Disagree Disagree Mostly Disagree Mostly Agree Agree Strongly Agree

Q8. Read each statement below. Select the answer which best represents the practices of the professional staff in your school.

Question	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
a. Make a real effort to recognize students for effort and improvement.					
b. Often tell students about the importance of making honor roll or being recognized at honor assemblies.					
c. Give a wide range of assignments matched to students' needs and skill level.					
d. Make a real effort to show students how the work they do in school is related to their lives outside of school.					
e. Encourage students to compete with each other academically.					

Q9. Which of the following best describes the school you serve in your current position as a building level administrator?

a. A primary school
b. An elementary school
c. A middle school
d. A junior high school

e. A junior/senior high school
f. A high school

Q10. Please indicate your sex.
a. Male
b. Female

Q11a. Enter the total number of years you have served as a building level administrator. Use whole numbers only. _____

Q11b. Enter the number of years you have served as a building level administrator in your current position. Use whole numbers only. _____

Q12. Which of the following content areas best describes your certification prior to becoming an administrator?
a. Elementary
b. Elementary - Electives and Specialists (Technology Education, Family Consumer Science, Computers and Business Education, Health and Physical Education, Art, Music, Foreign Language, Library Science, Special Education, Guidance, etc.)
c. Middle School – Math and Science
d. Middle School – Social Studies and Language Arts
e. Middle School - Electives and Specialists (Technology Education, Family Consumer Science, Computers and Business Education, Health and Physical Education, Art, Music, Foreign Language, Library Science, Special Education, Guidance, etc.)
f. High School – Math and Science
g. High School – Social Studies and Language Arts
h. High School - Electives and Specialists (Technology Education, Family Consumer Science, Computers and Business Education, Health and Physical Education, Art, Music, Foreign Language, Library Science, Special Education, Guidance, etc.)

Thank you for your time and valuable input. If you would like to read the report of my findings, please email me at slw38@pitt.edu

Have a wonderful day

APPENDIX G

LETTER OF INTRODUCTION TO SUPERINTENDENTS

To: Potential Superintendents

From: Shannon L. Wagner, Doctoral Candidate
University of Pittsburgh
School of Education

Date: September 29, 2014

As a doctoral candidate at the University of Pittsburgh, I am studying Carol Dweck's work with mindsets. My study will investigate the mindsets principals report and how they operationalize these mindsets in their leadership roles. I am seeking approval to contact your building level administrators via email to participate in my research study. Participation in the study is strictly voluntary and confidentiality will be maintained via the University of Pittsburgh's *Qualtrics* electronic survey system. The principals' names, districts, or schools will not be used in the study. Participants may withdraw from the study at any time, for any reason, without penalty. There is no more than minimal risk to individuals who participate in this research. There is no financial compensation for participation. The survey will take no more than 10 minutes to complete. If you have questions or concerns regarding the study, I am available at or .

Please consider my request to survey your building level administrators by responding to this email with confirmation of your approval. Once I receive your email approval, I will contact your building level administrators via email. I would be happy to share dissertation findings and results with you if interested.

I appreciate your time and hope to hear from you soon.

Sincerely,

Shannon L. Wagner
Doctoral Candidate
University of Pittsburgh

APPENDIX H

LETTER OF INVITATION TO BUILDING LEVEL ADMINISTRATORS

To: Building Level Administrators

From: Shannon L. Wagner, Doctoral Candidate
University of Pittsburgh
School of Education

Date: October 6, 2014

As a doctoral candidate at the University of Pittsburgh, I am studying Carol Dweck's work with mindsets. My study will investigate the mindsets principals report and how they operationalize these mindsets in their leadership roles. I have approached your superintendent to request permission to contact you for potential participation in my study. You are receiving this email because your superintendent approved my request.

Below is a link to the survey in which I am asking to your participate. It will take approximately 10 minutes. Participation in the study is strictly voluntary and confidentiality will be maintained via the University of Pittsburgh's *Qualtrics* electronic survey system. Your name, district, and school will not be used in the study. Participants may withdraw from the study at any time, and for any reason, without penalty. There is no more than minimal risk to individuals who participate in this research. There is no financial compensation for participation. If you have questions or concerns regarding the study, please feel free to contact me at or .

The survey will be open from October 6 to October 31, 2014. I appreciate your time and hope you will be a part of my study. I will be happy to share the findings with you at your request.

Sincerely,

Shannon L. Wagner
Doctoral Candidate
University of Pittsburgh

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